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THE CONDITIONS AND PROSPECTS OF BRAZIL.

BY THE REV. G. W. CHAMBERLAIN,

OF S. PAULO.

Arnold Guyot, in his book, "The Earth and Man," in the spirit of a devout philosopher, calls our attention to the fact that the contour and relief of the continents of the earth, the shape of the dry land, is a divine prophecy of the development of the human race; and he laments that the word *geography*, in its limited and restricted sense, does not express the truth, and that the word *geology* was not at his service to express the science of the earth.

In a word, physical geography, calling our attention to the handwriting of the Creator in the material earth, forecasts the drama of humanity to be enacted on it. But what has all this to do with the subject, *The conditions and Prospects of Brazil?* Much every way, since it determines that that land shall be:

1. One and indivisible.
2. A healthy habitation.

3. A theatre for the congregating the families of the earth.

Any atlas of physical geography will show that Brazil is separated, as it were, from the rest of South America. See that great belt of green indicating the two great hydrographical systems, which surround Brazil as with broad arms, and consider that the slightest depression of the earth's surface would have left Brazil an island. It is said that in the rainy season you can pass from the headwaters of the confluents of the Amazon to the headwaters of the river La Plata in a Rob-Roy canoe. Consider the rivers, and you will have a foreordained answer to the surmise which has been raised in correspondence about Brazil, as to whether it can maintain its unity; as to whether Brazil will ever be divided into one, two or three nations. Its topography and configuration have predetermined the question. There is no chance for a division. You will see this by the way the waters run north and south from the vast water-shed, which embraces the region between 15° and 20° south latitude. Divide the country if you can. You cannot. No more than ours was to be divided. Secession was a rebellion against civil government not only, but it was a rebellion against divine law written on the earth, and therefore impossible. Brazil, by eternal determination, is to be one and undivided.

But is it habitable? The question, "Is Brazil healthy, a healthy place for living?" arises, because it is a region of the earth of which we possess a very limited knowledge, acquired through our trade at the shipping ports merely; so that the information we have received of the healthfulness of some of those ports

has given us the impression we have of all Brazil; as though New Orleans were to be considered a type of the healthfulness of the United States.

Study the map, and you will realize that there is there prepared an immense theatre for the development of the drama of human life, since He, whose hands formed the dry land, has pushed up Brazil high towards heaven, so that even in the inter-tropical regions it is a "habitable part of the earth."

Physical geographers call our attention to yet another very significant fact. They tell us that the Old hemisphere, by the contour of it, foreordained the *separation* of the human family, the division and scattering of the families of the earth, whereas the New hemisphere tends to the *congregation*, the gathering together of the peoples. What they discover written upon the face of the earth, we perceive in the history of the last century, rapidly advancing in our country; so that from every quarter of the earth they are coming in and fulfilling the eternal purpose, written upon the very physical geography of our land. It is in vain for our legislators to close the "Golden Gate" against the Asiatic, or Castle Garden against the European. Just as surely as water seeks its own level, so the peoples inevitably seek our land, and they will come. There is no wisdom in Congress, or in any body of men, to bring about a law which shall defeat the eternal law. Come they will, and it were better that we adjust our shoulders to the burden of receiving them in the spirit of the precept: "Freely ye have received, freely give." The blessings of our civilization and liberty belong to the nations of the earth; let us see to it that these nations

shall have part in the blessings, which have been given to us as a precious legacy.

A similar theatre has been prepared on the southern half of this continent, in what we now know as the United States of Brazil. Vast area, healthfulness, and indivisibility, all point to a congregation of the families of man and a vast development in the near future.

It is remarkable that, just as we are fearing that we are having a little too much, a little more than we can adjust, of this immense tide of human life, Brazil, which has been reserved for such a time as this, is thrown open, and is stretching out her arms to all the nations of the earth, and asking for labor to develop her resources.

In the year 1500 a Portuguese fleet, meaning to double the Cape of Good Hope on the way to their East India possessions, was deflected against the coast of South America. Cabral announced that he had discovered something, and took possession in the name of Portugal; and in the name of the King of Heaven, erecting a cross upon this new shore, called it the "Land of the Holy Cross." Is it not a marvel that the little nation on the extreme western coast of Europe should be able to hold four thousand miles of Atlantic coast against all comers? If you will look back over old maps of the 16th Century, you will see that France thought that she possessed a large portion of South America, and went so far as to name it Antarctic France. Later, the Dutch, in the 17th Century, possessed themselves of the northern coast of Brazil, and for a period of thirty years held it with strong forts. You will find their forts still in the cities of Pernambuco

and Bahia. The descendants of the Portuguese are in possession, but neither the French nor the Dutch remain. Either of these nations was stronger than Portugal, yet it was given to that little nation to possess this vast dominion. Why? In order that it should lie for a time in the hands of a nation which would with a jealous spirit seal it up hermetically, and hold it closed to commerce. Portugal not only possessed, but possessed exclusively, all Brazil, and excluded from trading at its ports all ships not coming from her own. In the present century, that scourge of Europe, Napoleon, threatened to swallow up Portugal. Her king fled from his European to his American dominions, and the court of Portugal was established in Brazil. Then, when other reasons prevailed, Dom John returned to Europe, leaving his son with the title of Regent. Already the spirit of Republicanism was abroad, and the wise old king perceived that there would be, and perhaps very soon, a development of the spirit which would wrest from Portugal that dominion. It is said that he gave secret instructions to his son to anticipate such a movement by breaking off Brazil from the old *régime*, while securing it to the dynasty of Portugal. Dom Pedro was the first to draw his sword, and exclaim "Independence." Thus Brazil became independent of Portugal with scarcely more bloodshed than now, when she passes from an Empire to a Republic without a single combat.

The spirit which was then prevalent among Brazilians demanded larger liberties. It was a time of great restriction in Portugal of expression of sentiment, and measures were adopted which expelled some of the most liberal minds. Many students of the law school

of Coimbra, the University of Portugal, came over as exiles to Brazil, and settled in the Province of Minas-Geraes. There were poets among them, men in whom poetic fire was burning brightly, and so these knights of the pen formed a fellowship in suffering and aspiration with those of the sword. At length one of their number, Silva Xavier, drew his sword, just one century ago this year, in 1789, with a cry for the Republic. He was one century in advance of God's time, and as a result he was hung, drawn and quartered. But the spirit of the man lived, and has been marching on in Brazilian history from that day to this. It obliged the first emperor to abdicate in favor of larger liberties of the people, in favor of the participation of the patriots in the government of the country. That abdication left a child, five years and four months old, Emperor of Brazil.

A very wonderful history is this of Dom Pedro the Second, who never saw his father from that time. Dom Pedro I. had wisdom and sagacity enough to confide this child to the care of the man, who had really forced the issue with him, recognizing in him a disinterested and devoted lover of his country. Jose Bonifacio De Andrada, "the Benjamin Franklin of Brazil," gave to the child's mind its bent, and led it out in love of truth, awakening in him a taste for study which has never abandoned him. Thus there was prepared an instrument, who should become a nursing father to the liberties of the people. The expressions which have been attributed to Dom Pedro since he landed in Europe, when urged by his son-in-law to abdicate in favor of his daughter, that they might use force of arms to bring

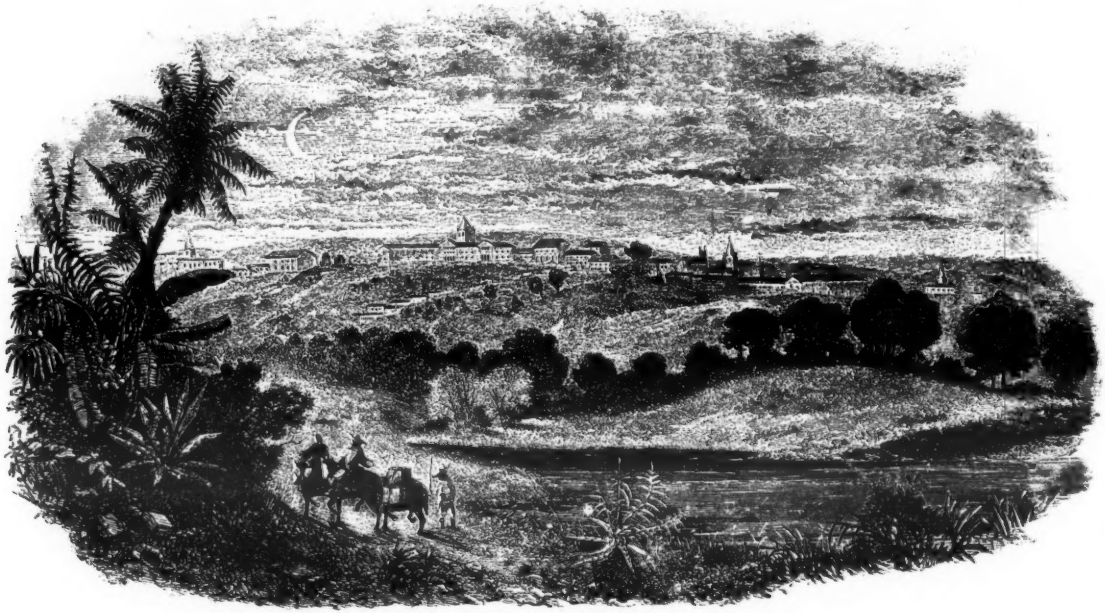
back the dominions to the crown, show that there is burning in his heart the same love of his country, the same appreciation of the liberties of the people, which he received in early childhood from his tutor.

This providence in the government of the land secured a quiet of nearly half a century, in which the seeds of civil government were growing and ripening in the hearts of the people. This must be taken into account if we would understand the late developments in Brazil, which are destined to change radically and rapidly its future. Before we touch upon the flitting and fleeting shadows of political geography, let us consider the physical conditions of the people who possess the land. When the Portuguese first discovered the land to which the fleet was driven by the wind, they found the Indian. It is estimated that we still have a million of Indians in Brazil. It is a mere estimate. We have no means of ascertaining the exact truth, for, indeed, a vast part of the territory has never been explored. Only last year (1888) German explorers going up a confluent of the Amazon River, the Xingú, found tribes of Indians of which there had never been notice even ; not nomadic, but agricultural in their habits. It has been said that the Indians of Brazil are inferior in some respects to those of North America. Yet they have the same qualities, physically. They show the same strong sense, the same keen perception of truth and justice, which has been revealed frequently in the " poor Indian " of our own country. It is narrated of one of these sons of the forest that on one occasion, when regarding an image, carved from the trunk of an orange tree on the plantation where he was domesticated, he stood

alone while others bowed in the presence of this image, and, when ordered to kneel, replied: "No! I knew him when he was an orange tree."

This native capacity of the Indian is displayed in his handiwork also. Two years ago, from the province of Paraná, a friend sent to Dr. Cornelius R. Agnew, of this city, a kind of blanket woven from the *urtiga* (wild nettle), which is a product of the forests of Brazil. It was marked by the regularity of machine work, yet the preparation and weaving of the threads was done entirely by hand, woven thread by thread, with wonderful skill. It was not a blanket to shield from the cold, but from the wet; and was almost impervious to rain.

Take hold of the bows, which demand gigantic strength to stretch them, or look at the wonderfully prepared arrows of these Indians, six feet in length, composed one-half of wood and the other half of bamboo, feathered, and pointed with some sharp point prepared from the bones of birds and animals, and recognize the same wonderful skill. Those who have lived among the Indians of Brazil tell of the precision with which they shoot their arrows. Calculating the parabola of the curve, they fire the arrow into the air so that it falls upon the only tender spot in the shell of the turtle, and pins him to the ground. Here is a power of calculation and estimation of forces that is scarcely exceeded by the most expert artilleryman. When, in the dense forests, they attempt to shoot a bird perched in some of the gigantic trees and miss their mark and the arrow disappears in the air, they wait attentively to hear its fall; if the ear fails to tell where that arrow is, they draw a second which passes through the branches in the



VIEW OF THE CITY OF S. PAULO.

identical spot, and those two arrows will be found together. These arrows cost them great labor, and are too valuable to be lost. The intelligence of these people, manifested in this cultivation of the hand, eye, and ear, reveals an element in the aboriginal population of Brazil, which demands our attention, and gives assurance that it will be rewarded with great developments, under wise direction.

General Couto de Magalhães, recently President of the province of S. Paulo, after graduating at the law school of S. Paulo, passed eight years of his life, fishing and hunting with the Indians. He afterwards prepared a grammar of their language and wrote a book entitled, "O Selvagem do Brazil"; and has engaged in various efforts to bring them under the power of civilization. In all his journeys among the Indians from Pará on the north to Paraná on the south (for he has repeatedly crossed the continent), he has not found any community which he could call Christianized.

Let us turn to another element of the population of Brazil. The slave trade brought into Brazil a vast element of labor, and we have now at least two millions of freedmen. They are from various tribes on the west coast of Africa. There is one tribe, the Mina, Mohammedan in religion, which has maintained its tribal relations even in slavery. They may be seen on the streets of Bahia and Rio de Janeiro, laying down their burdens and kissing the hand of a fellow slave, recognizing his rank as prince, or priest. A few years ago an old grey-haired black stopped in front of the show-window of the British and Foreign Bible Society's store, to gaze upon an Arabic Bible. He entered and inquired

for the holy book. When the agent showed him the Bible, he turned its pages and said, "No, that is not the book." He wanted the Koran. He could not be induced to take a copy of the Scriptures. A few days after he returned and asked how many such copies existed in that depository, and purchased all they had. (Rio de Janeiro has become a sort of highway of the nations, so that the Bible in many tongues is kept to anticipate any demand, that might arise from ships passing there from the ends of the earth.) This slave had been liberated by the common purse (for his tribe maintained a common purse), and was about to return to Africa. He was a priest of that tribe. Their masters never found it profitable to endeavor to keep them in abject slavery, and have given them considerable liberty, each one paying daily a certain quota to his master. Among the merchants of Brazil are blacks of this tribe, who have acquired wealth. Many other tribes, of less intelligence and energy, who have borne the burden and heat of the day in developing the agricultural and mineral resources of the Empire, are now a component part of the population of Brazil. This points to another of the social problems, which confront the statesmen of the new Republic.

Turn now from these inferior races of Indians and negroes to the ten millions of the dominant race. The original stock is Portuguese. In habit, customs, style of dress, manner of living in the homes which they have made for themselves, they resemble the people of Southern Europe. The Portuguese mingled their blood with the Indians, and we have mestiçoz; they

mingled their blood with the negro, and we have the mulattoes. Those ten millions are by no means therefore all pure blooded Portuguese. While a small per cent. of them are pure Portuguese, Portuguese customs obtain among them in the whole country, and the Portuguese tongue is the language of the country. Spanish is spoken in all the rest of South America, except in Guiana. While Spain possessed the Western coast, there fell to Portugal most of the remaining territory, equal to one-fifteenth part of the whole earth, one-fifth of the New World, or three-sevenths of South America. These, in brief, are the physical conditions.

What are the intellectual? The schoolmaster was abroad in Brazil very early. No sooner did Portugal possess the land than her first shipment of colonists was accompanied by tutors. There was a school in the province of S. Paulo as early as 1554. Around the little hut, in which that school began on the 25th day of January, 1554, there grew up a city. It has now 50,000 inhabitants. There also grew up vast establishments, monasteries. While Brazil was still a colony, the Marquis of Pombal expelled from the Portuguese dominions the Jesuits. Some of their buildings were appropriated to schools of quite another character under the civil government. We have there the oldest law school on this Western hemisphere. This affords the nearest approach to a university education, which Brazil has given to her youth. Some years ago, a young Brazilian, graduated from the law school in S. Paulo, came to the city of New York and established a paper, *O Novo Mundo*, for circulation in his own country. He was well known as a member of the Univer-

sity Club. Lawyers in this city said of him that he knew more law than lawyers brought up in our own country are expected to know, before they have been ten years, at least, in practice. The course of law at S. Paulo is five years, and there is a preparatory course, in which every candidate for the law course is expected to pass an examination in at least eleven studies. He must be prepared to consult Blackstone in English, and other works of law in French, for the course embraces the wide international department. These preparatory and law schools bring together in that centre young men, from the Amazon to the river La Plata, for a period of at least five years of their lives. Through this and similar schools in Pernambuco, Bahia and Rio de Janeiro, Brazil has disciplined largely the mind of her educated classes, and some of the marvellous fruits of this discipline you have seen in the peaceful Revolution of November 15, 1889. This may explain how it is that men could have so prepared a nation as to pass from one form of civil government to another, with scarcely any more agitation than the passing of night into day.

Brazil has also her medical schools. Any man who carries his certificate from New York, Edinburgh, or elsewhere, is not admitted to practice in Brazil until after he has sustained theses before either the Faculty of Bahia, or that of Rio de Janeiro. She has also her Polytechnic School, which is comparatively new. The present Minister of War was at the head of such a school in the city of Rio de Janeiro. She has public schools, very inefficient, it is true, owing in part to the sparseness of the population, and the great difficulties

to be overcome in the indisposition of the people to learn. In parts they have established obligatory education, and, where the population is within a certain radius of the schoolmaster, the inhabitants are obliged to send their sons and daughters to school. Because of the inefficiency of the public school system, recently, there have been great efforts to establish normal schools. Unfortunately for these schools, they have been placed in the hands of men, who have derived their ideas of education largely from books. Those who graduate from them walk on stilts over the heads of their pupils. It is evident that the people are reaching out after a better system of education. In 1884 there was held in the city of Rio de Janeiro an Exposition, to which other countries were asked to contribute, to enable the Brazilians to gain a clear idea of education in all its branches. That Exposition became permanent, and the articles which were contributed by other lands became a useful object-lesson to the teachers who visit the Capital.

Turning now from these elements in the social condition of Brazil, let us look for a moment to the new condition, involved in the change of the form of government. It was first announced to us as a *coup d'état* of arms. It excited the greatest astonishment, that a handful of soldiers should be able to carry the Empire, and effect so radical a change in a single day. How shall we account for it? Remember the sword which Silva Xavier (Tiradentes) drew in 1789, and for which he was slain a century ago. Consider that that sword has been beaten not into pruning-hooks, but into pens. Throughout the century, from that day to this, there

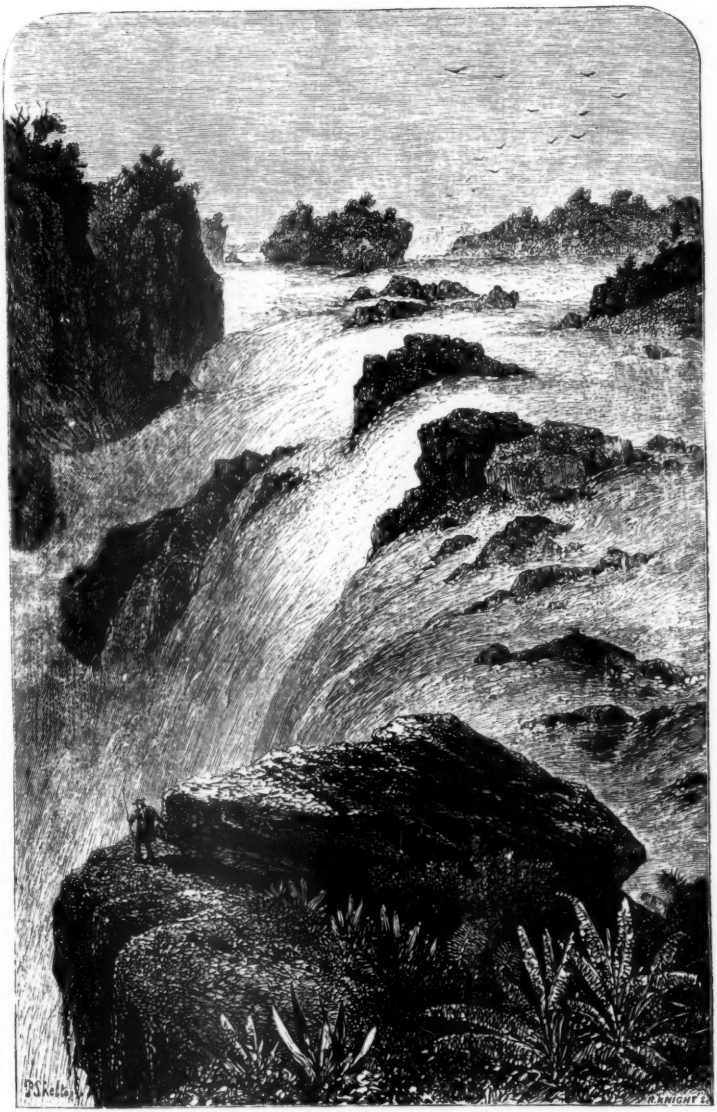
has not lacked a man to write in defense of the idea, for which he gave his life. This has been doubly so in the last quarter of a century. Quintino Bocayuva, now the Minister of Foreign Affairs, in the new Republic, co-editor in 1870 of the paper entitled *A República*, advocated openly in the city of Rio de Janeiro principles of republicanism. He has continued to write from that time with a pen, which has merited for him a title such as was given to Chrysostom. It has been a golden pen, a pen of moderation, of firmness, of consistency, and it has scarcely ceased, day or night, to scatter the seeds of free government on the wings of the press. When it was found that the paper, *A República*, could not yet be sustained, the Republicans wisely dropped it, but continued to advocate their principles through the daily papers of the country. Many of the young students of the law school and medical schools have been associated with them in this service ever since. It was evident to those of us, who were in Brazil in September, 1888, that their principles were already prevalent, and would soon become dominant. When the Deputy, elected from the very Province of Minas where "Tiradentes" was slain in 1789, presented himself as the choice of his fellow citizens for his seat in the parliament as a Republican, and openly declared his unwillingness to take the oath of allegiance to the monarchical government, or to support the religion of the state in which he was not a believer, he was required to retire. The House resolved itself into a Committee of the Whole, and Conservatives and Liberals vied with each other in maintaining that that man was just as much entitled to his seat in the House as any of them. One of the Con-

servatives maintained that he was more entitled to his seat than some of them, saying, "He appears to have more conscience than the most of us." The deputy was admitted to his seat. It was evident, therefore, that the principles, which had been advocated by Republicans, animated both the Liberals and Conservatives, and there was no appearance of resistance, and no disposition to resist them. Later, when the Conservatives were unable to command a majority in that wary House, and the Emperor dissolved it and called a Liberal to form the Ministry, and that Ministry on the 7th of June last took its seat, there were cries on the part of some of the members of the House of "Down with the Monarchy," "Long live the Republic." Therefore, the movement has not taken by surprise those who have been watching the current of affairs in Brazil, except in this, that it was not anticipated so soon. It was not in the spirit of the people to displace the old monarch, who had endeared himself to them by many of his traits of character, nor was it the popular desire that he should be disturbed in his lifetime. It was feared that his political life would be cut short by his leaving or abdicating his throne in favor of his daughter. This fear led to such a combination among the leaders of the parties, and the army and navy leavened with republican principles, that there was no resistance in any quarter to a quiet passage from one form of government to another.

I am persuaded that Dom Pedro is better satisfied himself to see his principles prevail under a Republican form, than to see them go down under his own dynasty. What are the prospects? Who can be a prophet?

XUM

There are many who prophesy the fall of the new government, who hold that it will certainly go to pieces. On the contrary, I am persuaded that it possesses the elements of permanency. The Provisional Government is composed of men of undoubted patriotism and ability. At the voice of the people they will yield their places peacefully to better men, if there are any. The man who was called into the presence of the Emperor on that eventful night (15th November) to organize a new Liberal ministry (Senator Saraiva), who had just arrived from a visit to Europe, has been looked upon for the last thirty years as the foremost man of the Liberal party, a man of counsel, prudence and moderation. If his life is spared, he will undoubtedly be promoted to the chief position in his country. But should he not be? Are there no other men capable of taking his place? One of the foremost Liberals in the province of S. Paulo said to me last January: "We have been like boys grown up in their father's house—the old gentleman always governing and guiding everything and putting no responsibility upon us, and now that he is become through age and disease unfit to govern, there is no one of us who knows just how to take hold of the helm, and steer the good ship." "That," he said, "is the condition of all parties." It does not imply, however, that there is no latent ability. I think we have seen it manifested that there is wonderful ability, and, put into play, it will develop itself marvellously. We have an eminent example in Ruy Barboza, the present Minister of Finance. The only thing to be feared for him is that his small body will not be able to carry his great head. Nothing worthy of note on the



THE PAULO AFFONSO, THE NIAGARA OF BRAZIL

XUM

principles of free government, whether published in this country, or in England, has escaped his attention. When in Parliament, he distinguished himself as the advocate of equal rights and religious liberty for all his fellow citizens. He applied himself during his absence from Parliament to the preparation of school books. He prepared the most rudimentary works for his people, thus employing his enforced leisure. That is the character of the Minister of Finance. There will not be wanting a man, while Ruy Barboza lives, to steer the ship of State. He is inspiring wise measures for the consolidation of Republican principles. The voting population of Brazil is a very small minority of the whole, and the provision, which limits the power of voting to those who can read and write, is designed also to stimulate education.

In an article but lately published the remark was made that the Emperor Dom Pedro had said that if he were not Emperor he would be a school teacher, for he considered the guiding of the mind and preparation of the character as the noblest mission on earth. It was remarked that, while it may be doubted now that, having ceased to be Emperor, he will become a school teacher, yet there is no doubt that the future of Brazil is in the hand of the school teacher.

In the closing chapter of "A Journey to Brazil," Professor Agassiz has set forth clearly his hopes for that land, where he had exceptional opportunities for observation. He saw three obstacles to progress—slavery, a corrupt clergy, and lack of educational institutions.

Slavery is a thing of the past. Religious liberty will

bring into play forces, which will require "a more vigorous, intelligent and laborious clergy." Education has received a great stimulus. We are drawing nearer to the realization of the brighter hopes entertained by the great naturalist, who thus expressed himself: "There is much that is discouraging in the aspect of Brazil, even for those who hope and believe, as I do, that she has before her an honorable and powerful career. There is much also that is very cheering, that leads me to believe that her life as a nation will not belie her great gifts as a country. Should her moral and intellectual endowments grow into harmony with her wonderful natural beauty and wealth, the world will not have seen a fairer land."

NOTE.—Chief among these natural wonders is the Paulo Affonso Fall of the S. Francisco River, 150 miles above its mouth. This Fall is described by Burton, in his "Explorations of the Highlands of the Brazil."

"The Quebrada, or gorge," he says, "is here 260 feet deep, and in the narrowest part it is choked to a minimum breadth of fifty-one feet. It is filled with what seems not water, but the froth of milk, a dashing and dazzling, a whirling and churning surfaceless mass, which gives a wondrous study of fluid in motion. . . . Here the luminous whiteness of the chaotic foam-crests, hurled in billows and breakers against the blackness of the rock, is burst into flakes and spray, that leap half-way up the immuring trough. There the surface-reflections dull the dazzling crystal to a thick opaque yellow, and there the shelter of some spur causes a momentary start and recoil to the column which, at once gathering strength, bounds and springs onward with a new crush and another roar.

"The heaped-up centre shows fugitive ovals and progressive circles of a yet more sparkling, glittering, dazzling light, divided by points of comparative repose, like the nodal lines of waves. They struggle and jostle, start asunder, and interlace as they dash with steadfast purpose adown the inclined plane. Now a fierce blast hunts away the thin spray drift, and puffs it to leeward in rounded clouds, thus enhancing the brilliancy of the gorge-sole. Then the steam boils over and canopies the tremendous scene. Then in the stilly air of dull warm grey, the mists surge up, deepening still more, by their veil of ever ascending vapor, the dizzy fall that yawns under our feet.

"The general effect of the picture—and the same may be said of all great cataracts—is the 'realized' idea of power, of power tremendous, inexorable, irresistible. The eye is spell-bound by the contrast of this impetuous motion, this wrathful maddened haste to escape, with the frail steadfastness of the bits of rainbow, hovering above; with the "Table Rock" so solid to the tread, and with the placid, settled stillness of the plain and the hillocks, whose eternal homes seem to lie here."

Further on, he writes: "We have also here the greatest possible diversity of falling water; it consists, in fact, of a succession of rapids and cauldrons, and a mighty Fall ending in the Mai da Cachoeira, upon whose terrible tangle of foam we have just looked down. If Niagara be the monarch of cataracts, Paulo Affonso is assuredly a king of rapids; an English traveller who had seen the twain, agreed with me in giving the palm to the latter, as being the more singular and picturesque of the two, which are both so wondrous and so awful."

XUM

RECENT DISCOVERIES IN EGYPT.

BY

MISS AMELIA B. EDWARDS.

The paper which I had the honor of reading before the American Geographical Society on December 9, 1889, and of which I am requested to write a *résume* for the Transactions of the Society, dealt principally with the very remarkable results obtained by Mr. W. M. Flinders Petrie in the course of his recent explorations in Upper Egypt. These results tend to show that there were colonies of European foreigners settled in Egypt at a much earlier period than has hitherto been supposed. They also prove the existence of alphabetic signs (and presumably of a system of writing) peculiar to those foreign settlers, and for the most part entirely distinct from the hieroglyphic signs by means of which the people of Ancient Egypt had, from immemorial time, recorded the deeds of their kings and the dogmas of their religion.

It is now more than a year and a half ago—in the spring, namely, of the year 1889—that Mr. Petrie, having completed his excavations at Hawâra, proceeded to explore the ruins of two small towns situate, like Hawâra, on the edge of the desert bordering the eastward limit of the Fayûm. The one mound is locally known as Tell Gurob, or "The Mound of the Raven;" the other was so little known or noticed by the natives, that only one old man remembered to have heard it

called Tell Kahûn, when he was a boy. Tell Gurob and Tell Kahûn lie about seven miles apart, on either side of the Bahr Jusûf Canal; and Mr. Petrie took advantage of their proximity to open both at the same time.

Even before beginning the work of excavation, Mr. Petrie recognized that the ancient towns represented by these two formless heaps of crude brick and desert sand were each of a single period: *i. e.*, that having been built, and for a time inhabited, they had been suffered to fall to ruin, without any pulling down and rebuilding, such as takes place in towns inhabited by successive generations. Each site was therefore a mere surface ruin; and, there being no accumulation of *débris*, the labor was comparatively light. The earlier site proved to belong to the remote period of the XIIth Egyptian Dynasty; the later site to the latter half of the XVIIIth Dynasty and the first half of the XIXth. Or, to be more exact, Kahûn was found to be the town built for the accommodation of the workmen and officials employed in building the pyramid of Usertesen II., fourth Pharaoh of the XIIth Dynasty (*circa* B. C. 2800); this being the pyramid known as the Pyramid of Illahûn.* The workmen probably migrated when the pyramid and funerary chapel were completed; but the town continued to be inhabited for two or three generations by a mixed population, and was deserted about the end of the XIIth Dynasty, or the beginning of the XIIIth.

Tell Gurob, on the other hand, was founded during the reign of Thothmes III. (*circa* B. C. 1400),

* This pyramid was at the same time explored by Mr. Petrie, who found it to be that of Usertesen II. There is an evident connection between the names Illahûn and Kahûn, both of which may possibly echo some very ancient name.

sixth sovereign of the XVIIIth Dynasty, and became extinct about a century later, in the time of Seti II. of the XIXth Dynasty (*circa* B. C. 1290).*

Kahûn, the workmens' colony, was laid out in parallel rows of narrow streets inclosed in a rectangular boundary-wall, and it appears to have somewhat resembled the Escurial as to plan. In the ruins of the houses, a vast number of domestic objects were found, as well as old tools left behind as useless, when the town was deserted. Among these were knives, chisels, nails, mallets, adze-blades and an adze-handle, in the house of a carpenter; two or three plasterers' floats in the house of a plasterer; a wooden brick-mould and a trowel in the house of a bricklayer; a mason's plummet; a laborer's sickle and hoe, etc., etc. As in all ancient Egyptian sites, there was, of course, a great accumulation of pottery broken and unbroken, some of the larger pieces of ware being incised with a rude imitation of basket-work, extremely archaic in style, and unlike any decorative motives known in Egyptian art. The shapes of the various vessels also differed from the shapes fashioned by Egyptian potters. Some of these pots, moreover, and a large proportion of the potsherds, were found to be inscribed with alphabetic characters scratched on the surface of the ware. These were apparently owner's marks, and therefore disconnected; but on one piece of curiously shaped wood, which formed probably part of the handle of a tool, was cut a word of five letters, evidently a name]TUEIA.

* These dates are calculated according to the chronology of Manetho, as adopted by Mariette. Mr. Petrie makes them about two centuries lower.

In this group of letters, and among the letters scratched upon the pottery and potsherds, it is a very remarkable fact that some look like modified hieroglyphs, while others are identical with certain characters of the kind known as "Cadmæan"—the earliest Greek derivative of the Phœnician.

Others closely resemble various letters of the Cypriote, Græco-Asiatic, and early Italic alphabets.

In the group of which a fac-simile is given above, we have for instance in the first letter the Etruscan ⌋; in the second, the Theran ⌉; in the third, a character rudely resembling the Etruscan ◇ or ◈; and in the fourth, a form nearly identical with the Phœnician ▨ or 日. The fifth sign, ⅄ may perhaps stand for the Egyptian hieroglyph 𓂝. The word spelled by these five characters is not yet satisfactorily deciphered.

Others of the signs scratched on the potsherds of Kahûn are unquestionably Cypriote, as in the following examples :

Kahûn.	Cypriote.
A	A
⊓	⊓
⅄	⅄
⋕	⋕
⧖	⧖
⩎	⩎

These are but six instances out of nearly forty parallelisms between the Kahûn and Cypriote signs.

The former are between seventy and eighty in all. Some are quite unknown; about a dozen are distinctly Egyptian; and the rest more or less resemble the alpha-

betic signs of Thera, Santorin, and Etruria. Of the "zvastika" so frequently found by Dr. Schliemann at Troy and Mycenæ, two examples are included.*

When we remember that the town in which these inscribed potsherds have been discovered was built during the reign of Usertesen II. (and doubtless at the beginning of his reign, it being customary for a Pharaoh to commence the preparation of his tomb as soon as he ascended the throne), and that the place ceased to be inhabited, if not immediately after the completion of the pyramid, quite certainly by the time when the houses fell out of repair, the remote date to which the foregoing alphabetic signs must be attributed becomes of profound significance.

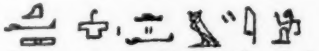
At Tell Gurob, a block sculptured with the ovals of Thothmes III. gave the earliest local date, while other objects inscribed with the names and titles of Tutankhamen, Horemheb, Rameses I., Seti I., Rameses II. and Meneptah show that the place continued to be inhabited till past the middle of the XIXth Dynasty. Here again, the houses had been left standing on the desert sand as at first erected, the upper parts of the walls having fallen in, and no attempt having been made at rebuilding. As at Kahûn, these ruined shells had become choked with rubbish, buried under the blown sand, and thus sheltered from observation and plunder. Neither site can, in fact, be accurately described as a "mound;" both being mere low-lying sand-heaps, such as might have accumulated over a natural rising ground at the edge of the desert.

* *Cf.:* The Alphabetic Tables of Thera, Phrygia, Lycia, Etruria, etc., in Maspéro's *Hist. Ancienne des Peuples de l'Orient;* also the alphabetic tables in Isaac Taylor's "*History of the Alphabet.*"

A large number of domestic objects were found in the ruins of private houses at Gurob, such as combs, netting needles, children's toys, scribes' palettes, toilet vases, spindles, whorls, baskets, balls of thread, etc., etc., as well as some very fine bronze knives, chisels, axe-heads, mirrors and the like. There was also an abundance of pottery, variously shaped and decorated, and the usual heaps of miscellaneous potsherds. Here again, a large proportion of the potsherds was found to be incised with alphabetic characters. The pottery of Tell Gurob is, however, quite unlike the pottery of Kahûn, both in style and workmanship; also, the alphabetic signs scratched on the Gurob fragments are less archaic, and much more easily identified, than the alphabetic signs of Kahûn. The pottery of Gurob is partly Cypriote and partly Mycenæan in type. False-necked vases, bottles of the well-known "pilgrim" shape, and vessels decorated with concentric patterns abound; all alike foreign to the hand of the native Egyptian potter. The alphabetic forms have passed the transitional stage of the Kahûn signs. They no longer bear a doubtful resemblance to hieroglyphic characters, or to "Cadmæan" Greek. They are distinctly Cypriote, with a sprinkling of letters identical with the alphabetic forms of Thera, Melos, Lycia, Phrygia and Etruria. Of Cypriote characters, Professor Sayce has verified 51, while of Egyptian hieroglyphs, there are 6 or 8 only.

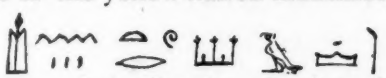
The epigraphic evidence thus far goes to prove the presence of two colonies of alien settlers on the border of the Fayûm, very near together as regards locality, but widely separate as regards date. The evidence, however, is not only epigraphic. In the cemetery of the

ancient town represented by the ruins of Gurob have been found interments of a foreign race; the bodies mummified "after the manner of the Egyptians," but with foreign names painted upon their mummy-cases, and skulls of an alien type. That they were a yellow-haired people is shown by the yellow and reddish locks yet thick upon certain of the mummied scalps. The interments are such as would be made for persons of good social position—not for captives or slaves. The coffins are painted black, with white inscriptions; and Cypriote pottery was found buried with the dead. The white ants have, unfortunately, done much damage to the mummy-cases, and but few of the inscriptions are legible. In one tomb, however, were found ten Cypriote jars and several Ushabti made for a man called



Kash-sadi-amia; a name distinctly Asiatic.*

Yet more remarkable is the name found upon the coffin of one of the yellow-haired mummies, called



An-Tursha, or *Aniu-Tursha*, of whom it is stated in his funerary inscription, that he was governor of the palace. It is to be observed that the above name is followed by the two determinative signs indicating a foreign country; while the name of the deceased clearly denotes that he was of the race of the "Tursha"—a nation† which first appears upon the mon-

*"*Sadi*" is found in Hittite names, and it is therefore probable that *Kash-sadi-amia* was of Hittite (Khetan) descent.

† See for the identity of the "Tursha" with the Tyrseni and Etruscans, "*Les Origines de l'Histoire d'après la Bible*" by F. Lenormant, Chap. xiii. pp: 132 *et*

uments of Egypt in the beginning of the reign of Rameses II., and which reappears in the fifth year of Meneptah, his successor. The "Tursha" have been identified by De Rougé and Maspéro with the Tyrsēni, or Etruscans; an identification confirmed by the late François Lenormant. That an Etruscan should have filled so important an office as that of Governor of the Palace, is very remarkable; this fact accounts, however, for the presence of Etruscan settlers in the town, as such settlers would naturally congregate under the protection of so powerful a compatriot.

Yet further evidence of foreign occupation has been discovered by Mr. Petrie at both Kahûn and Gurob, in the presence of weights differing in all respects from the weights current in ancient Egypt. Eight of these weights (all of foreign standards, or multiples of foreign standards) were found in Kahûn. One important example weighs 30 x 399 grains, which is double the 200 grain weight, less one grain only. That is to say, it is based on a multiple of 30, which is the Æginetan standard; whereas, if based on the Egyptian standard, it would be a multiple of 20 or 50. The weight is marked "thirty" in Egyptian numerals . The earliest example of weight of the Æginetan standard previously found in Egypt was of the time of the XVIIIth Dynasty; whereas this of Kahûn is of the XIIth Dynasty.

Thirteen foreign weights were found at Tell Gurob, all based on the Assyrian shekel standard. Some of these were of hematite, and one was of lead. Only one Egyptian weight was found at Gurob, and not even one at Kahûn.

seq. 2d Edition. Also, E. de Rougé in "*Les Attaques dirigées contre L'Egypte*," *Revue Archéologique*: Vol. xvi., new series.

These facts are conclusive. They prove that both sites were, at widely separate periods, occupied by foreigners, and that these strangers adhered to their national standards of metrology. It is remarkable that the Æginetan standard should prevail in the earlier settlement, and the Assyrian standard in the later; more especially as the later settlement was largely inhabited by an Etruscan colony, who might be expected to follow the Æginetan system. It was, however, in Gurob that the Asiatic named *Kash-sadi-amia* lived and died; we may therefore conclude that there was also an Asiatic (possibly a Hittite) element in the community, and that the Assyrian shekel-standard was established by Asiatic settlers.

Our knowledge of the Greeks from historical Greek sources may be said to begin with the First Olympiad. It is at this point that tradition is succeeded by history. But our knowledge of the Greeks from sources external to Hellas dates from an infinitely earlier period, and it comes to us from Egypt. In a tablet carved on the cliffs of the valley of Hammamat, which leads from Coptos to the Red Sea, there exists to this day a record of the victories of Sankhara, last king of the XIth Dynasty (*circa* B. C. 2500) in which he boasts that he has "broken down the strength of the Hanebu;"—"Hanebu," (which means "the people of all shores") being the name by which the coast-folk and islanders of the Ægæan were designated, not only at that remote time, but as recently as the reigns of the Ptolemies.* The fact that this very ancient race-name continued in use up

* See *Les Origines de l'Histoire d'après la Bible* by F. Lenormant, Chap. xiii. p. 21, 2d Edition, 1884.

to a date comparatively modern (and this despite the distinctions made under the new empire between Danæans and Achæans, Lycians and Carians, etc., etc.,) leaves us in no doubt as to its application. Earlier, therefore, by a century than the beginning of the reign of Usertesen II., in whose time Kahûn was built for the housing of the foreign workmen employed on the pyramid of Illahûn, we find an Egyptian king celebrating his triumph over the island tribes and coast tribes to which those workmen belonged. This is the earliest mention of the Greeks in the history of the world.

Turning next to the time of Thothmes III, we find it recorded in his famous "Chant of Victory"* that this Pharaoh had vanquished the people of "Kefa and Asi," and those "who dwelt in their islands"—*i. e.*, the people of Phœnicia and Cyprus, and the islanders of the Archipelago. And it is precisely during the reign of Thothmes III. that the site of Gurob is occupied by foreign settlers, some of whom inscribe their pottery with Cypriote characters, while all employ the Assyrian standard of metrology.

Take them from what point of view we may, these coincidences are very remarkable. But first and foremost stands the extraordinary fact that from the ruins of two small and insignificant hamlets, which no previous traveller had observed and which not even the neighboring Arabs had thought worth plundering, Mr. Petrie has disinterred the earliest Greek alphabetic signs yet discovered. In the characters scratched upon the pot-

* See "The Tablet of Thothmes III." translated into English by Dr. Birch, *Records of the Past*, Vol. II; also the French version of Mariette in his Catalogue of the *Musée de Boulaq;* ditto, Maspéro, in his *Histoire des Peuples Anciennes d'l'Orient*, Chap. v., p. 202.

sherds of Kahûn, rude and tentative as they are, we seem not only to detect the very beginnings of that alphabet, but to see it in the course of its development from Egyptian hieroglyphs, and possibly (as Professor Maspéro has suggested) from the masons' marks employed by Egyptian workmen. These inscribed potsherds are contemporary with a period which, according to a generally received opinion, coincides with the descent of Abraham into Egypt.

The inscribed potsherds of Gurob date from a reign computed at some twelve or thirteen hundred years later; and, even so, are more than two centuries earlier than the accepted date of the Exodus.*

When these dates are compared with the dates of the earliest specimens of Greek writing previously known—namely, the rock-cut inscriptions of Santorin and Thera, which Lenormant attributes to the 9th century, B. C., and the famous inscription cut upon the leg of one of the colossi at Abû Simbel, which is contemporary with the 47th Olympiad—the extraordinary importance of Mr. Petrie's discovery is thrown into startling relief. It carries back the history of the alphabet to a period variously computed at from 2,500 to 2,300 years before the Christian era; and it shows that the Iliad may, after all, have been committed to writing while Homer yet lived to dictate it.†

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* The inscribed potsherds of Kahûn and Gurob are deposited in the Department of Greek antiquities in the British Museum, and are open to the inspection of all who desire to examine them.

† Since the above discourse was delivered before the American Geographical Society (on December 9, 1889), Mr. Petrie has published a full account of his discoveries, entitled "*Kahûn, Gurob and Hawâra*," to which I refer all who desire to become more fully acquainted with the subject. A. B. E.

DEFINITIONS OF GEOGRAPHICAL NAMES, WITH INSTRUCTIONS FOR CORRECT PRONUNCIATION, FOR THE VARIOUS HIGHER SCHOOLS.

A SUPPLEMENT TO EVERY SCHOOL GEOGRAPHY.

BY

KONRAD GANZENMÜLLER, Ph. D.

THE IBERIAN PENINSULA.*

SPANISH: *stérra*=range of mountains, or *mountains*, *mónte*=*mountain*;—*Iago*=*Jacob*, James, *Andér* (for *Andrés*)=*Andrew*;—*mayór*=*greater*, *menór*=*smaller*, *serrāto*=*jagged*, or *toothed*, *nevādo*=(covered with snow), *snowy*, *maladēto* (Aragonese), or *maldīto* (fem. *maldīta*) =*cursed* (cursed by God), *san*, *sant*=*saint*, holy.

THE BALEARIC ISLANDS are distinguished after their size; MAJORCA (Sp. *Mallorca*) means THE GREATER ISLAND, and MINORCA (Sp. *Menorca*)=THE SMALLER ISLAND.—SIERRA NEVADA=SNOWY MOUNTAINS.—MONTSERRAT=THE JAGGED MOUNTAIN (so called from its appearance);—MALADETA=THE CURSED *group of mountains* (so named on account of its wildness).

SANTIAGO=SAINT JAMES (so called in honor of the Apostle James, patron of Spain);—SANTANDER=SAINT ANDREW.

* This portion of Dr. Ganzenmüller's MS. was received too late for the BULLETIN of June 30, in which it should have preceded the remarks on France.

PORTUGUESE: *sérra=mountains, cãbo=cape; pórto=harbor; — açór=hawk; rõca=rock; — estrélla=star; são=saint*, holy; *o=the* (masc. sing.); *—de=of, da=of the* (fem.).

The AZORES=ISLANDS OF HAWKS (so called from the great number of hawks found there).—CABO DA ROCA =THE ROCKY CAPE (the steep western point of Europe; —CABO SÃO VICENTE=CAPE OF SAINT VINCENT,—SERRA D'ESTRELLA=MOUNTAINS OF THE STAR, *or* STAR RANGE.

PORTO=HARBOR (also named *Oporto=the harbor*).

GREEK: *πόλις=city, Πομπεῖος=Pompey, πίτυς=pine;— ἑσπέρα=*(evening), *west; —βάλλειν=to sling.*

The PITYUSES (in Greek *Πιτυούσσαι*)=ISLANDS OF PINES;—BALEARIC ISLANDS=ISLANDS OF SLINGERS (the Balearian slingers are celebrated in the military annals of antiquity).—HESPERIA (as the Iberian Peninsula was named by the ancient Greeks)=THE WESTERN COUNTRY, —*Pompeiopolis* (in Biscayan *Pomp-aelo*), now PAMPLUNA =CITY OF POMPEY (its reputed founder).

LATIN: *térra=*(earth), *land, pórtus=harbor;—Cæsar =emperor;—victõria=victory, pax=peace* (rest), *finis =ena;—nóvus* (*fem. nóva*)*=new.*

CAPE FINISTERRE (*finis terræ*)=CAPE "LANDSEND." —*Portus Cale, harbor of Cale*, was the original name of the modern Porto, and from these two words is derived the Latin PORTUCALIA=COUNTRY ABOUT THE HARBOR OF CALE, now PORTUGAL;—*Pax Augusta*, now (in a Spanish corruption) BADAJOZ=REST OF AUGUSTUS (the Roman Emperor);—*Cæsarea Augusta*, now ZARAGOZA= CITY OF THE EMPEROR AUGUSTUS;—*Victoria*, now VITORIA=CITY OF VICTORY (battle A. D. 1813);— *Carthago nova*, now CARTAGENA=NEW CARTHAGE.

CELTIC: *pyra*, hence the PYRENEES=MOUNTAINS;—*dūr*, hence the DUERO RIVER.

BISCAYAN: From *ibárra* or *the great river* was derived the Latin *Ibērus*, the modern EBRO=STREAM; and from *ura=water*, and *asta=rock* is formed the compound ASTURIA=THE ROCKY COUNTRY ON THE WATER, *or on the sea.*

PHŒNICIAN: The ancient *Ibūsim*, the later *Ebūsus*, the modern IVIZA is synonymous with the Greek *Πιτυούσσα*, and means THE ISLAND OF PINES.—*Gadir*, later *Gades*, now CADIZ=(hedge), CASTLE (a Phœnician settlement).

ARABIAN: *jesīreh*=(island, or also) *peninsula*;—*gēbel=mountain*, *wādi=river*; *gharb=west*;—*ábiad=white*, *kĕbir=great*;—*al=the.*

From *Gebel al-Tarik* was derived GIBRALTAR=MOUNTAIN OF TARIK (a Moorish general, who conquered this place, A. D. 712).—The *Bætis*, etc., *see* . . . p. 213.

SOUTH AND CENTRAL AMERICA, MEXICO, WEST INDIES.*

SPANISH: *isla=island*, *cósta=coast* (coast region), *cābo=cape*, *púnta=point of land*, *tĕrra=land*, (region), *istmo=isthmus*, *sĕrra=mountains*, *cordillēra=a chain*, or *a range of mountains*, *cérro=a ridge of mountain*, *nevādo=snowy mountain*, *pīco=peak*; *rĭō=river*, *desaguadēro=a drain*; *val=valley*, *angostūra=narrows*, *páramo=desert highland*; *cĭūdád=city*, *villa=town*, *city*; *pŭérto* (in Portuguese *pórto*),=port, *harbor*,—*nórte=north*, *ecŭădór=equator*; *dĭós=God*, *espīritu=spirit* or *ghost*, *trinidád=trinity*, *salvadór=saviour*;

* Instructions for *pronunciation* of *Spanish* and *Portuguese words* and *names* have been given on pp. 211–213.

príncipe=prince; Andér (Andrés),=*Andrew, Iago=James, Josē=Joseph, Jŭán=John; mádre=mother; Lūcia=Lucy; gallīna=fowl, galāpago=turtle, anguilla=eel; pīno=pine, pásto* (and *pásco*)=*pasturage; argentino*=(adj.) *silver, plāta=silver, esmerálda=emerald, arēna=sand; agŭās=waters; pāta=paw,* or *large foot, cabéllo=hair; cruz=cross* (crucifix), *pīlar=pillar;—pāso=passage, parăiso=paradise, aire* (plur. *aires* or *áyres*)=*air, fūego=fire;—dominīca=Sunday, domingo=Sunday,* Lord's Day, *asúncion=assumption, paz=peace;—grācias=thanks, gránde=great, mayór=greater, blánco=white, colorādo=red* (or colored), *vermējo=red, nēgro=black, caliénte=hot* (ardent), *templāda=temperate, frīŏ=cold, nevādo* (fem. *nevāda*)=snow covered, *snowy, rápido=rapid, salādo*=(salty), *brackish, dúlce=sweet, fresh* (water);—*bŭēno=good, vēro=true, rico=rich, rĕál=royal, san, sant* (fem. *sánta*)=*saint* (holy);—*el* (plur. *los*)=the (masc.) *la*=the (fem.);—*de=of* (gen., with the masc. article *del=of the*); *a=to* (dat).

Tierra del Fuego=land of fire (so named by Magellan on account of *great fires* which he saw along the coast and which he supposed to be the eruption of volcanoes);—Trinidad (*island*) was discovered by Columbus, on the 31st of July, 1498, and received its name in honor of *the Holy* Trinity;—San Salvador (*island, country* and *city*)=the Holy Saviour;—Santa Lucia=saint Lucy (discovered by Columbus, on the 13th of December, 1498, the day of Santa Lucia);—Dominica (island)=Sunday (discovered by Columbus on the 3d of November, 1493, a Sunday, in ecclesiastical Spanish *dominīca*, Lord's Day);— Santo Domingo (*island, state,*

and *city*)=THE HOLY SUNDAY, or *holy Sabbath*);—ISLAS DE LOS GALÁPAGOS=ISLANDS OF TURTLES;—ISLA DE PINOS=ISLAND OF PINES;—ANGUILLA=EEL—(*islana*); PUERTO RICO, in Portuguese *Porto Rico* (*island* and *city*)=THE RICH HARBOR.—CABO DE LAS GALLINAS=CAPE OF FOWLS;—CABO DE LA SANTA CRUZ=CAPE HOLY CROSS:—CABO DEL PILAR=CAPE OF PILLARS (or *columns*); —CABO DE GRACIAS A DIOS=CAPE THANKS TO GOD!—PUNTA DE ARENAS=SANDY CAPE (or *sandy point of land*).—THE CORDILLERAS=THE CHAINS OF MOUNTAINS; "*Andes*," from Peruvian "anti," signifies *copper*, or *metal* in general, and *the* CORDILLERAS DE LOS ANDES, therefore, means *the* CHAINS OF THE METAL or *copper mountains*;—CORDILLERA REAL=THE ROYAL CORDILLERA;—SIERRA MADRE=MOTHER MOUNTAINS (so called in distinction from the chains running out from this range of mountains);—SIERRA NEVADA DE SANTA MARTA=THE SNOWY MOUNTAINS OF SAINT MARTHA;—NEVADO DE SORATA=THE SNOWY PEAK OF SORATA;—PICO DE ORIZABA=PEAK OF ORIZABA (so the *Citlaltépetl* is named by the Spaniards);—PICO MAYOR=THE GREATER PEAK (*i. e.* the *Popocatépetl*);—PÁRAMOS=DESERT HIGHLANDS (in the Cordilleras);—RIO COLORADO=RED RIVER;—RIO VERMEJO=RED RIVER;—RIO NEGRO=BLACK RIVER;—RIO GRANDE DEL NORTE=GREAT RIVER OF THE NORTH; —RIO RAPIDO=THE RAPID RIVER, also named RIO DE SANTANDER=RIVER OF ST. ANDREW (in Mexico);—(*Rio de*) LA PLATA=(*river*, or *stream of*) SILVER (so called by Diego Garcia, in 1527, from the silver brought to him by the natives);—RIO DE SAN JUAN=RIVER OF ST. JOHN;—RIO SALADO=THE BRACKISH RIVER: RIO DULCE (in Argentina and Guatemala)=THE RIVER OF

FRESH WATER;—DESAGUADÉRO=A DRAIN (*i. e.* from LAKE TITICACA to LAKE PANSA).

In *Mexico* and *Central America* the belts of land are distinguished as: TIERRAS CALIENTES=THE HOT REGIONS (on the coast), TIERRAS TEMPLADAS=THE TEMPERATE REGIONS, and TIERRAS FRIAS=THE COLD REGIONS (*i. e.* the highland);—COSTA RICA=RICH COAST; EL ISTMO=THE ISTHMUS (of Panama);—ECUADOR=EQUATOR (so named from its position under the equatorial line);—ARGENTINA =LAND OF SILVER;—PATAGONIA=LAND OF THE MEN WITH LARGE FEET (so called by the discoverer Magellan and his companions, from the large-footed men (*Patagones*) found there (see pp. 370–371, JOURNAL A. G. S., 1887);—BOLIVIA=LAND OF BOLIVAR, liberator of the South American States from Spanish dominion;—COLOMBIA=LAND OF COLUMBUS.

ANGOSTURA=(*city on the*) NARROWS (*of the Orinoco*); it is also named CIUDAD BOLIVAR=CITY OF BOLIVAR;—VILLA DE MINAS=CITY OF MINES (in Uruguay);—CIUDAD REAL=ROYAL CITY (in Mexico);—PUERTO PRINCIPE= HARBOR (OF THE) PRINCE;—PUERTO CABELLO=HARBOR OF HAIRS;—ESMERALDA=EMERALD;—AGUAS CALIENTES =HOT WATERS or *springs* (in Mexico);—EL PASO (*del Norte*)=THE (*northern*) PASSAGE (a frontier-town of Mexico;—PASTO, and PASCO=(*place of*) PASTURAGE; hence CERRO (*ridge of mountain*) DE PASTO, and CERRO DE PASCO;—VALPARAISO=VALLEY OF PARADISE; VERA CRUZ=THE TRUE CROSS;—SANTA FÉ=THE HOLY FAITH; —ASUNCION= (*the city of*) ASSUMPTION; LA PAZ=THE PEACE (or *place of peace*)in Bolivia and Lower California; —BUENOS AYRES=GOOD AIR.—ESPIRITU SANTO=(*city of the*) HOLY GHOST (on the island of Cuba);—SANTIAGO

=St. James;—San José=St. Joseph;—San Juan=St. John.

Portuguese: *bahia=bay, cãbo=cape, recife=reef, sérra=mountains, cordilheira=a chain of mountains, riŏ*=river (*water*), *bárra=a narrow entrance;—cidade=city, villa*=(village), town, *city; pórto=harbor;* o sánto (plur. *os sántos*)=the saint;—*Lúis=Lewis, Pédro=Peter;—Roque* (Rōke)=*Rochus;—madéiro=wood; sélva=forest; mãtto=copsewood,* bushes;—*mina* (plur. *minas*)=*mine; ouro=gold;—espinhaço*=(the spine, and) *a ridge of mountain; Janéiro=January;— nórte=north, sul=south, bránco=white, nẽgro=black, prẽto=black, grósso=large, grande=great, béllo* (fem. *bélla*)=*beautiful, segũro=secure, alégre*=(vivid), *frequented, gerál* (*plur. geráes*)=general; *diamantino* (fem. *diamantina*)=*rich in diamonds; são=saint,* holy;—*tõdo* (plur. *tõdos*)=*all; o* (plur. *os*)=*the* (masc.), *de=of* (genit., with the masc. article: *do=of the*).

Bahia de todos os Santos=bay of all the saints (discovered on *All Saints' Day,* in 1503).—Cabo Branco=the white cape;—Cabo de San Roque=Cape of St. Rochus (so named because it was discovered on the 16th of August, 1502, the day of *St. Rochus*); —Serra do Espinhaço=the ridge of mountains;—Cordilheira Grande=the great Cordilheira (*the great chain of mountains*);—Cordilheira Geral=the general Cordilheira.—Rio Branco=the white river, a tributary of the Rio Negro=the black river;—Rio Grande do Sul=great river of the south (River and Province in Southern Brazil, so called in distinction from the Rio Grande do Norte=great river of the north;—Madeira=wood river (it

carries along great tree-trunks in times of floods);—SELVAS=FORESTS;—MATTO GROSSO=THICK COPSE WOOD;—MINAS GERAES=GENERAL MINES.

BAHIA (city)=BAY;—(*Cidade de*) RECIFE (*de Pernambuco*)=(*city on the*) REEF (*of Pernambuco*);—VILLA BELLA=THE BEAUTIFUL VILLAGE, or *city*;—PORTO SEGURO=THE SECURE HARBOR;—PORTO ALEGRE=THE FREQUENTED HARBOR;—RIO DE JANEIRO=WATER OF JANUARIUS (it is situated on an arm of the sea named "*Janeiro*," probably from its discovery by Solis on the feast-day of *Januarius*, January 1, 1501);—BARRA DO RIO NEGRO=THE NARROW ENTRANCE INTO THE BLACK RIVER;—OURO PRETO=THE BLACK GOLD;—DIAMANTINO (in Matto Grosso)=and DIAMANTINA (in Minas Geraes) =RICH IN DIAMONDS;—SÃO LUIS=SAINT LEWIS;—SÃO PAULO=SAINT PAUL; SÃO PEDRO (*do Rio Grande*)=SAINT PETER (*on the great river*).

* The settlement of BLUMENAU in Brazil was founded by the German physician, DR. BLUMENAU, of Brunswick, in 1850.

FRENCH: *port=harbor, terre* (terr)=*land, prince* (prŏ̄ss)=*prince*;—*Pierre* (Plérr)=*Peter, Thomé* (Tomē) =*Thomas*;—*croix* (krŏā)=*cross*:—*grand* (grâ)=*great, basse* (bass)=*low*; *St., saint* (să)=*saint, holy*;—*au* (ō)=*to the* (dat).

ST. CROIX (island, and city)=HOLY CROSS;—ST. THOMÉ=SAINT THOMAS.—The island of *Guadeloupe* is divided into GRANDE TERRE=THE GREAT LAND, and BASSE TERRE=THE LOWER LAND;—PORT AU PRINCE=HARBOR OF THE PRINCE;—ST. PIERRE=SAINT PETER (on the island of Guadeloupe).

* Definitions of some *Mexican geographical names*

have been given on p. 371, JOURNAL, A. G. S., 1887.

In the *language of the natives of South America* ORINOCO means a STREAM, *para*, hence PARANÁ=RIVER and PARAGUAY=RIVER OF PARROTS; ÁRAU=*free*, and, therefore, ARAUCANIANS (in Chile)=THE FREE MEN;—PETCHERAIS=FRIENDS (so named from their addressing the strangers by the word "*petcherais*)."

The STAITS OF MAGELLAN, so called because discovered and first navigated by *Magalhães*, or MAGELLAN (Spanish), a Portuguese navigator in the Spanish service, in the first voyage round the world (1519–20).—The name of ANTILLES originated from *a mythological island*, ANTILLA, which the first discoverers thought to have found in the island of Hayti.—The VIRGIN ISLANDS were discovered by Columbus, in 1494, and so called by him (in honor of the "*eleven thousand* VIRGINS)."—The FALKLAND ISLANDS were first named after the *English Lord* FALKLAND, but, afterwards, *Isles Malouines* (by French navigators of *St. Malo*); hence in English MALOUINE ISLANDS.—JUAN FERNANDEZ (island) was discovered by a navigator of the same name, in 1576.—CAPE HORN (*Hoorn*) was so called by the Dutch discover, Schouten, after his native town, the *city of* HOORN, in Holland; and ASPINWALL (Colon) took its name from ASPINWALL, *the builder of the railway over the isthmus of Panama.*

*After European cities, *Cordoba* (in the Argentine Republic), *Granada*, and *Leon* (in Nicaragua), *Nassau* (on the island of New Providence), *Valencia* (in Venezuela) and many others.

FOUR WEEKS IN THE WILDERNESS OF SINAI, WITH NOTES ON EGYPT.*

BY

DR. H. CARRINGTON BOLTON.

It is to be remembered that my experience in the Peninsula of Sinai was limited to a single visit.

Arriving in Cairo February 1st, 1889, I spent the first week of this month in Cairo, the second and third on the Nile, the fourth, and the first two weeks of March, again in Cairo and vicinity. I entered the desert, March 13th, and four weeks later returned to Cairo, finally leaving Egypt on April 15th.

In the earlier weeks named, the temperature at the hotel in Cairo ranged from 60° to 65° at 8 A. M. to 75° and 78° at 3 P. M., falling to 64° and 67° in the evening. In April it was warmer, but never oppressive in the shade. On the Nile steamer greater extremes were noted; 54° at midnight (Feb. 19th) to 87° at 2.30 P. M. (Feb. 9th). The latter figure was exceptional and was regarded as oppressive, but the changes in any period of 24 hours are not commonly very great. Luxor is attaining some reputation as a health resort, on account of the equable temperature and dryness of the atmosphere. In the first three months of 1889, the average temperature out of doors at the hotel is thus given:

	9 A.M.	2 P.M.	6 P.M.
January	60°	68°	65°
February	60°	70°	68°
March	71°	81°	78°

*A paper read by Dr. Bolton before the New York Academy of Sciences.

Authorities state that, as a result of ten years' observations, the mean temperature in the Delta and at Cairo is 58° in winter, 83° in summer, and 66° in autumn; the lowest record in the Delta is 35°, the highest about 95° in the shade. In Upper Egypt, however, the temperature rises to 109°.

The temperatures that I noted in the desert of Sinai were taken at great differences of elevation, my route extending from the sea-level to the summit of Jebel Mousa, 7,400 feet high. I copy a few records from my journal.

In Plain of Shur (perhaps 50 ft. above sea-level.)

March 13th	7.30 A.M.	59°	
"	3.00 P.M.	80°	in sun
"	8.30 P.M.	66°	
March 14th	7.00 A.M.	50°	
"	7.00 P.M.	70°	
March 15th	7.00 A.M.	62°	
"	9.30 P.M.	75°	(south wind)

In Wadi Feirân, and beyond.

March 19th	6.30 A.M.	52°	(rain)
"	9.00 P.M.	52°	

At Monastery of St. Catherine (5,000 ft.)

March 21st	8.00 A.M.	48°	
"	9.00 P.M.	55°	
March 22d	6.30 A.M.	46°	
"	10.00 P.M.	56°	
March 23d	8.00 A.M.	57°	
"	9.30 P.M.	60°	
March 24th	7.00 A.M.	54°	
"	10.00 P.M.	62°	
March 25th	7.30 A.M.	59°	
"	11.00 A.M.	72°	
"	10.30 P.M.	66°	
March 26th	7.00 A.M.	62°	
"	9.00 P.M.	66°	

Wadi Es-Sleh to Tor.

March 29th	6.00 A.M.	(Wadi)	67°	(1,500 ft.)
"	3.00 P.M.	(Tor)	88°	
"	10.00 P.M.	(Tor)	75°	

Summit of Jebel Mousa (7,400 ft.)

March 22d. ..... 9.30 A.M. in shade, 46°
" ..... " in sun, 70°

Camp on Gulf of Suez.

March 31st..... 9.00 A.M. in sun, 88°
" ..... " in shade, 72°

On Seetzens Slope, Jebel Nagous.

March 31st..... 11.00 A.M. in sun, 86°
" ..... " in shade, 72.5°
" ..... 2.00 P.M. in sun, 100.5°

The highest evening temperature was on March 17th, after the Khamsîn had blown all day,—at 7 P. M., 84°. The lowest temperature observed was on March 20th, in camp about 3,000 feet above the sea,—at 6.30 A. M., 33°.

My first experience in Egypt was calculated to give the impression that it is a rainy country, for I saw two showers in three days. In passing through the Suez Canal (January 31st), a heavy shower, lasting half an hour, drove the passengers to shelter, and a brilliant rainbow delighted beholders. Two days later, rain again fell at night in Cairo. Of course this experience was exceptional in Cairo. The rainfall at Alexandria is about 8 inches per annum, and at Cairo about 1.2 inches; while in Upper Egypt there are adults living who say they have never seen rain.

I noticed, on the other hand, unmistakable signs of recent rains, such as dried mud-puddles, raindrop-prints, etc., at several points, near Cairo, east of Thebes (Wadi Bab-el-Molook), and in the peninsula of Sinai, and I was impressed with the belief that more rain falls in Egypt than is usually supposed. A local shower passing over a sandy, gravelly region, makes but little

impress on it; and there is no corps of trained observers, outside of Cairo and Alexandria, to record the phenomenon. On visiting the Khedivial Astronomical Observatory just out of Cairo, I was cordially received by the Director, Mr. T. Esmatt, a graduate of the Ecole Polytechnique of Paris, and for three years an assistant in the Naval Observatory at Washington. I take pleasure in mentioning his politeness and courtesy, but cannot omit pointing out a weakness; he took me to the roof of the building to see the meteorological instruments, and I noted that the rain-gauge was quite full of water; this again gave me reason to regard Egypt as a rainy country. (The last shower fell one month previously.)

Being on the lookout for signs of water in the desert of Sinai, I made the following notes:—The slight depressions in broad plains and the deep, narrow valleys in the hill country, both indiscriminately called wadis, present the appearance of dried-up water-courses: the signs are unmistakable,—a tortuous channel with vertical sides carved out of the gravelly bottom, pebbles and boulders transported from distant sources scattered over the surface, mud-flakes and mud-cracks in small bays, as it were, at the sides of the main channels. At two or three places on the sea-coast, extensive mud-flats were pitted with characteristic raindrop impressions. The line of the now arid water-course was often bordered by scanty and hardy shrubs.

Between March 13th and April 8th (1889) rain fell three times in my vicinity; twice the fall was insignificant, but on March 19th rain fell abundantly in Wadi Feirân, from 7.15 A. M. to 9.30 A. M. Heavy mists had

obscured the peaks bordering this extensive valley nearly all the preceding day; the temperature during this rainfall was 52°, elevation about 1,900 feet.

That heavy falls of rain and even of snow occur in December and January in the Sinai region, is reported by many travellers; in the defile of Nakb-el-Hawi (5,000 feet) crossed by pilgrims *en route* for the sacred mountain, the winter rains make veritable torrents; in 1867 the water rose to such a height in the valley adjoining Wadi-Selâf, as to wash away a camp of Bedouins, causing a loss of 40 lives and of numerous cattle (Baedeker). Captain Palmer describes also a sudden precipitation so copious as to fill the bottom of Wadi Feirân to the depth of several feet, causing the party to seek high ground. That the Oasis of Feirân was once a site sufficiently important to become an Episcopal See, is known to students of history; this was in the second to the sixth century A. D. A few cut stones, the capital of one column, and ruined sites, alone remain to indicate the locality.

Judging by the great boulders and trunks of palms which I saw in the lower part of this valley, I am disposed to believe that heavy rains are not infrequent. Casual observations by travellers, who move their tents almost daily, are unreliable data for scientific conclusions as to the meteorology of the country. Unfortunately, the monks residing at the Monastery of St. Catherine, care for none of these things.

Returning for a moment in thought to the Nile valley, I note that although the sun usually shines with great brilliancy, it is a mistake to infer that the sky is uniformly cloudless. In March there were many cloudy

days, some of which would, in this country, have been regarded as rain precursors.

Powerful winds sweep across the plains and through the valleys of Arabia Petræa, with a violence and continuity that I have not elsewhere experienced. In the spring months the prevailing wind in the desert is from the north and northwest, down the Gulf. This wind is a cool one, but it occasionally veers around to the south and becomes oppressively hot. In April and May this south wind, called *Khamsîn*, blows unremittingly for days together, scorching the traveller's skin and filling the orifices in his head with a very fine dry dust. Khamsîn is from an Arabic word meaning fifty, so called from a mistaken notion that it blows for a period of fifty days before the summer solstice.*

In the Nile valley, north winds prevail during the heated period of eight months, and southern winds during the rest of the year; these being in the opposite direction from the winds in the region of the Red Sea.

I witnessed three characteristic sand-storms at localities far apart and under varied circumstances. On February 15th, when riding a donkey through Thebes Nileward, a powerful west wind arose in the afternoon, blowing before it the fine dust from the Libyan desert. Words fail to describe the discomfort of such a sand-storm; the fine dust seems able to penetrate everything except perhaps an unbroken egg, and it is quite impossible to escape from it; to prevent suffocation, I borrowed from a fellah a coarse yet closely-woven blue outer garment and wrapped my head up. Donkeys did

* The dictionaries agree in defining *Khamsin* as a wind that blows for fifty days, beginning about the time of the vernal equinox.

not seem to enjoy the phenomenon any better than the Bedouins, and they shrunk from its blast as well as the travellers. On reaching the river, we alighted, but found the waves so high that boats could not cross to take us over, and we had to wait in patience until the force of the wind was spent. I tried lying down on the shelving shore, but the coarser grains of sand driven near the surface cut into the skin with painful effects. After crossing to Luxor in a boat, we found the residents in the large hotel much inconvenienced by the penetrating dust, although the building is screened by a handsome garden.

My second experience was in Cairo itself. On March 6th a northwest, and consequently a cool, wind blew dust from the adjoining desert into the city with such power as to obscure the usually brilliant sun during an entire day. The barometer fell 0.46 inch at the time, and the thermometer indicated 66° at 8.30 A. M., and 67° at 10.30 P. M. Residents of Cairo said that the sand-storm was the severest in twenty-five years, and of an unusual character,—being accompanied by a low temperature instead of the scorching Khamsîn. The following day was clear and cool. The dust penetrated every cranny and gave hotel servants hours of labor.

I experienced a third sand-storm in the desert of Sinai, on the plain of El Markha; it was accompanied by a scorching south wind, and the drying effects on the skin and the capital orifices produced greater discomfort than the suffocating dust and cutting sand; my party could do nothing but sit in silence on the camels, facing the storm, and the poor animals forgot to snatch at the tufts of scanty shrubs, as is their custom. After

crossing the plain, we entered a defile and rose to a considerable height on the Nakb-el-Budra ; the sand-storm continued, quite spoiling our enjoyment of the wild scenery and making photography impossible. In the evening the fierce wind very nearly overturned our tents in spite of extra stays, and at dinner every course was seasoned with the all-penetrating dust. The temperature at 7 P. M. was abnormally high, 84° ; just twenty-four hours later it had fallen to 58°, the wind having meanwhile veered around to the north, bringing with it heavy mists.

A single instance of electrical display was observed on March 26th, while in camp at Sinai. My companion, Henry A. Sim, Esq., of the Madras Civil Service, while lying in the tent, drew bright sparks from the woollen blankets by friction ; the temperature without was about 64°.

Before dismissing the subject of climate, I wish to testify to the invigorating, delightful air in the desert ; it has a bracing quality that enables one to expend much energy without fatigue. From about 1 to 3 P. M. the glare of the sun is often great, and shade is a comfort ; but the constant breeze, sometimes rather too strong, tempers the heat. I suspect, too, that the air is very free from disease-germs.

Of the dreaded Khamsîn, however, I can say nothing favorable.

I made several excursions in the neighborhood of Cairo ; on the west lies the river, and across the bridges cultivated fields so far as irrigated ; beyond that the Libyan desert. On the east the quick transition from the streets of a city, swarming with 400,000 inhabi-

tants, to the sterile desert, is very striking; passing through an arched gateway, and by some sorry-looking Mohammedan burying-places, one immediately finds himself on gravelly undulating plains, devoid of water or foliage, extending in monotonous uniformity to the Gulf of Suez, about 80 miles distant. Jebel Mokattam, a lime-stone range on the south, rises nearly 500 feet above the city; my aneroid gave the elevation of the highest point overlooking Cairo as 694 feet above the sea-level, or 485 feet above Shepheard's Hotel. The desert, broken occasionally by low ranges of hills, has a hard gravel and pebble floor, chiefly limestone, with fragments of silex in the form of brown flint and chalcedony. Loose sand lies only in hollows between hillocks, the tops of which are wind-blown and bare. On the surface at certain points lie fragments of fossil wood, and rarely half-buried trunks of the same; it is dignified by the name of "Petrified Forest." Some of this fossil wood proves to be good phonolite.

I noticed here again evidences of water-courses, recent mud-flakes, etc. At the time of my visit the customary strong cool breeze prevailed, and the temperature was 74° in the shade at noon (March 8th).

On February 16th I visited a wild valley west of Thebes, known as Wadi Bab-el-Molook, celebrated for the numerous and well-preserved Tombs of the Kings, of great interest to archæologists. My experience and impressions of this arid region were as follows:

Passing from the river bank through green cultivated fields of the Nile basin, the sterile, gravelly desert begins abruptly, the sudden transition being determined

by the irrigating canals and channels. At the mouth of the valley, about two miles from the Nile, the scene is one of utter desolation; absolutely no vegetation of any description is visible, not a dry lichen nor a gray shrub. Beneath the feet is a hard gravelly floor, grayish-white in color, consisting of broken and powdered limestone from the neighborhood, intermingled with nodules and pebbles of silex. True flint, from white to liver-brown in color, and having characteristic conchoidal fracture, is abundant. The silex commonly takes the concretionary form, some of the shell-like and ring-shaped masses reminding one of fossils. But little sand is present.

At the entrance of the valley the hills rise at a gentle slope, their sides being here and there dotted with large masses of limestone with a firm cement, or rather with seams, of dark-colored quartz. The strata, as seen by the unaided eye, appear to be horizontal. The rock has a shaly character in places, being deeply weather-eaten, friable, and soft. Ascending the valley, a spur divides it into two converging ravines; following the longer one to the west, the walls of limestone become precipitous, the quartzitic masses larger, and the general aspect wilder. At some places the limestone runs into chalk; this is especially well seen on entering one of the numerous Tombs of the Kings, the inclined passages penetrating hundreds of feet into the heart of the mountains.

The valley terminates in a *cul-de-sac*, about half a mile from its mouth, forming an amphitheatre of nearly vertical walls apparently 200 feet high, above which rise steep slopes perhaps 500 feet higher. These verti-

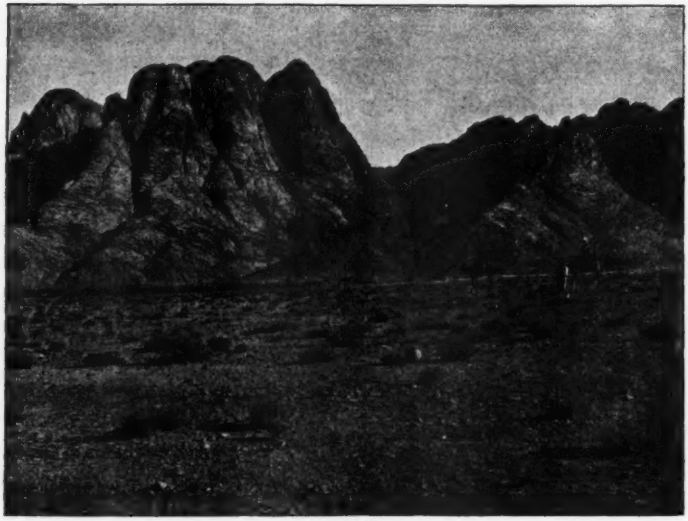
cal walls are split by vertical joints into broad or narrow columns, making picturesque features.

The valley throughout shows that water has at some time been energetically at work; the floor resembles a dried-up mountain torrent; banks of gravel, sand, and boulders rise several feet above the bridle-path on each side; and at the lowest part, small channels wind about the large rocks. The hillsides are furrowed by ravines excavated by water. Here and there in low places, usually at the foot of a large boulder, were unmistakable signs of recently-formed mud. The scales and mud-cracks were quite fresh, and seemed to indicate that water had accumulated in pools not more than two or three weeks before. On my return to Luxor, I was informed that rain had fallen about three weeks before (February 16th).

A sharp peak rises high above the walls of the amphitheatre referred to; on the slopes of this peak several parallel bands of horizontal limestone differ in compactness, the softer wears away rapidly and the harder projects over the shaly inclines.

Climbing up a steep path, and crossing the narrow ridge through a slight depression, I descended into the valley of the Nile; limestone passed into shale, and this into cultivated ground. The numerous excavations of small tombs, the grand ruins of the Rameseum and of Medinet Haboo, with the Colossi standing like sentinels on the plain, now drew off my attention from the geological features of the place.

The physical geography of the Sinai region is rarely represented with accuracy on published maps; Sinai often appears as an isolated peak, or at most as a detached



MT. SINAI.

group of mountains, whereas the whole peninsula is covered with sterile hills and clusters of mountains, except on the borders of the three seas by which it is bounded. The best maps known to me are those published by the Ordnance Survey, and by the Admiralty of Great Britain; these seem to be topographically complete, but Jebel Nagous is not shown with accuracy. My own observations were limited to the following route: from Suez to Sinai by the usual caravan route through Wadi Feirân, thence through Wadi Es-Sleh to Tor on the Gulf, and back to Suez by the usual route along the sea-coast, a distance of about 380 miles. The region, which is about the size of New Hampshire, contains within its boundaries three marked features:

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comparatively level plains, low ranges of limestone and sandstone hills, and an irregular group of bold granite mountains whose peaks rise to the height of 8,000 feet. Each of these regions is furrowed by wadis, or dry water-courses, which present very different aspects in the three divisions named. In passing from Suez to Sinai, by the usual route, one meets these features in the order named.

The first 52 miles of the journey, occupying about two days and a half, as camels travel, passes over an arid, sterile plain about ten miles wide from the low range of limestone hills on the east, Et Tîh, to the Gulf on the west. This plain, like that of El Gâa, to the south, rises gradually from the sea to the foothills, and is undulating towards its southern end. It is crossed by broad, shallow wadis, running east and west, which were perfectly dry at the time of my visit; Wadi Werdân, the largest, is depressed but a foot or two below the level of the plain and is approximately three miles in width at about six miles from the point where it enters the sea.

The most extensive plain on the western side of the Peninsula is that of El Gâa, which is about 80 miles long and 15 wide at its widest point. From the sea-coast to the mountains bordering it on the east, it rises nearly 1,000 feet, but so gradually as to deceive the eye and appear level. It is crossed by many shallow wadis, and its northern half is separated from the sea by a range of limestone hills (Jebel-el-Araba) reaching a height of 1,600 feet. When the plain was covered by the sea, this range was probably an island, or series of islands. The plain is rarely broken by hills, the sharp-pointed

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Krên Utûd, conspicuous from a distance, being an exception. I crossed the monotonous desolate waste, from the mouth of the beautiful Wadi Es-Sleh to Tor (or Tûr), on the Gulf, a distance of about 15 miles, and noted scarcely a dozen tufts of plants; water is absolutely wanting. North of Tor, however, and east of Jebel-el-Araba, are palm-gardens that extend for several miles in a narrow belt; and these date-bearing trees owe their existence to several saline springs, occurring at intervals, some of which are quite warm. On this sterile plain, the characteristics of a desert are seen in perfection; the level expanse is not too broad to conceal the lofty mountains on the east, nor to prevent glimpses of the blue sea on the western horizon; the floor is a firm hard surface, made up of a compact mixture of gravel and coarse sand, so hard indeed that camels make no impress on it with their broad feet. At some places the surface pebbles are of many shades of brown, intermingled with black and white, and these are so closely laid and regularly distributed as to resemble a mosaic pavement, but of course a patternless one. The surface particles are generally coarser than those immediately beneath; they are chiefly limestone, sometimes of coralline limestone, intermingled with flint and other varieties of amorphous quartz. Many of the pebbles show on their surface beautifully regular pittings and furrows carved out by the wind-driven sand. The fine-grained sand has all been lifted high in air by the powerful winds, whirled away and dropped into depressions or on the lee sides of hills. Hundreds of acres have no surface stones larger than an ostrich-egg; no water whatever is found in this region, much

less any signs of vegetable or animal life, rarely even a passing bird.

On this desolate plain, when overtaken by night, one place is as good (or bad) as another for pitching the tents, unless perhaps a small hillock is reached, which may serve as a partial shelter from the gales that sometimes threaten to overturn the canvas.

In the region of extensive plains, the wadis, or dried-up water-courses, being depressed but little, closely resemble them. The floor of the wadi hardly differs from that of the plain, except when a torrent has swept before it large boulders and deposited them irregularly in its bed. The sorting power of the water, however, is noticeable, as also the well-defined vertical walls, perhaps only a few inches deep, excavated at the point of lowest level. On the margins, too, of the wadis of the plain, and at points protected from the full force of the winter floods, several varieties of green shrubs grow in widely separated tufts. I often remarked mud-cracks, apparently of recent date ; but these indications of water probably remain undisturbed in this desolate region for a considerable period, perhaps for several seasons.

In the limestone hills these wadis take the form of cañons, having nearly vertical walls, sometimes hundreds of feet high—as in Wadi Tayyibeh. The regular erosion on their sides produces often picturesque effects, as at Ras Abu Zanimeh.

In the granitic district the wadis form V-shaped valleys broken by narrower ones entering at right angles, and bounded by bold peaks many thousand feet above the beholder. In the beds of these wadis are scattered specimens of the rocks of the surrounding country ;

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often boulders of great size testify to the violence of the torrents during the winter months, especially in Wadi Feirân.

The absolute dependence of the population of Egypt upon the Nile is a familiar fact.

The conditions of occurrence of water in the desert are perhaps less familiar. Not only is water scarce, but when obtained a large proportion of it is saturated with saline matter to such an extent that the soil in the vicinity is white with efflorescent salts of soda, magnesia, and lime. The "bitter waters" of Marah are not exceptional. The longest journey that I made without meeting good drinking-water was on the return from Tor to Suez, a distance of about 150 miles, occupying six-and-a-half days. On this route we passed a well in Wadi Gharundel where camels and Bedouins slacked their thirst, and our water-barrel was replenished with water for washing; but had we not been supplied with sweet water from the Nile, brought down to Tor on a boat from Suez, we should have fared badly. At the time of my visit, all wells were very low, and in some places entirely dried up.

Good water, flowing from springs and running short distances,—say, a quarter of a mile before sinking into the thirsty soil,—is found in Wadi Feirân and in Wadi Tarfa. In the former place, many date-palms and even barley-fields make a charming oasis; at the latter, palms. canes, and tamarisks line the babbling brook, as it may truly be named, but the oasis is not extensive. North of Tor, on the Gulf, are flowing springs of warm and saline water, not very palatable, but admirably adapted to the culture of date-palms, of which there are many

thousand. The best drinking-water in the region that I visited is on the flanks of Sinai; there are four wells within the monastery walls, one without, and others in the Leja valley and vicinity.

The warm saline spring at the foot of Jebel Hammam Mousa, is described by several travellers as sulphurous; but at the time of my visit it was assuredly devoid of the characteristic taste and smell of sulphuretted hydrogen. Its temperature is 92°–94° and it is strongly saline.

Hot springs issue from caverns filled with steam at the base of Jebel Hammam Farûn, a mountain of crystalline limestone on the Gulf of Suez. Russegger says the vapor had a sulphurous smell and the walls of the caverns were encrusted with sulphur. The saline water has a temperature of 153°, and is used by the Bedouins for curative purposes.

In Wadi Es-Sleh, the romantic gorge southwest from Sinai, I discovered a cold and sweet sulphur spring, agreeable to the palate. It issues in the centre of the wadi, at a point two hours' journey east of its mouth, and flows a short distance, depositing characteristic bluish sulphur on its borders; it was this latter that first attracted my attention. This spring is not mentioned by Baedeker.

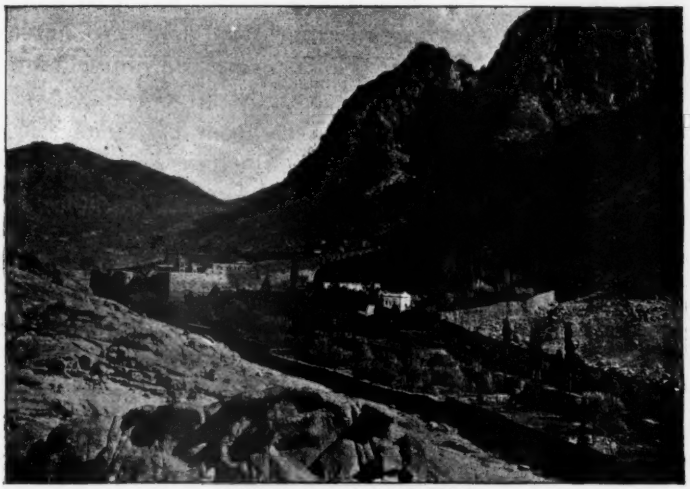
The total absence of ponds and lakes is a marked feature in the peninsula of Sinai; rain does at times fall in abundance, but it rushes down the wadis into the seas. Yet there is evidence of the existence of lakes at some earlier period; in Wadi Feirân, banks of earth 60 to 100 feet high rest on the mountain sides, especially in the angles of the valley, showing clearly the former

existence of a lake, the barrier of which was probably near Hererât. I noticed also at the point where the Wadi Es-Sleh enters the plain of El Gâa, unmistakable signs of an ancient lake; the wadi emerges suddenly from the mountain range, and a circular depression from 30 to 50 feet deep, with a perfectly level sandy bottom, and bounded by nearly vertical gravel cliffs, now marks the bed of a small lake.

The uninhabitability of the Peninsula is due to its sterility rather than to its climate; its sterility is due more to the unequal annual distribution of the water, than to its absence, and storage-dams, easily constructed in the narrow granite-walled wadis, would to a great degree remedy this defect. Perhaps at some future day, when a crowded world thrusts its population into regions now hardly habitable, Arabia Petræa will bloom like a garden. Granite and limestone furnish valuable soil ingredients, and the climate is not unfavorable to semi-tropical cultivation.

The extent to which evaporation from the surface cools the contents of the earthenware kullehs is notable; at 11 A. M. the temperature of the air in the shade was 72°, and that of the water in a goglet (kulleh) only 53°—a difference of 19 degrees. During the cold nights, the water in our barrels fell to a low temperature. A party of Americans who ascended Jebel Katharin, while I was camping at Sinai, found ice near the summit and enjoyed the luxury of iced water.

Fraas says of the Mt. Sinai group: "This huge range, composed of primeval gneiss and granite, has undergone no geological change since the time of formation of these crystalline masses; they have reared their ma-



MONASTERY OF SAINT-CATHERINE.

jestic summits above the ocean from the beginning of time, unaffected by the transitions of the Silurian or Devonian, the Triassic or chalk periods." At the base only do these mountains show any trace of alterations; thus the Red Sea has on one side thrown a girdle of coral around Mt. Sinai, and so produced a coast district; while towards the north the sea during the Cretaceous period has formed the limestone plateau of Et Tîh (4,000 feet above sea-level), which stretches across the peninsula to Mt. Lebanon.

A very remarkable feature is the variety and beauty of the colors of the rocks; in the limestone region every imaginable shade of yellow, red, brown, and gray, besides snow-white and quite black, give the barren cliffs a picturesque appearance; in the granite region this gray

crystalline rock is traversed in all directions by dikes of eruptive diorite, varying in color from black to green and brick-red. In Wadi Tarfa I counted nine narrow red and green dikes in a space of twelve feet. Elsewhere the dikes varied in width from two inches to thirty feet and more; sometimes the red porphyry traversed the green, and sometimes both lined the same fissure in the granite. The colors are as well-defined as those on a geological map, and combining with the strong atmospheric coloring of an almost cloudless sky, that produces bright lights and deep shadows in the foreground and an indefinable haze on the distant mountains, together with the deep blue of the mis-named Red Sea, produce an incomparably artistic effect.

The main object of my journey being a search for sonorous sand, my attention was naturally directed to the occurrence of sand in general. Large banks of blown sand are characteristic features in the Nile valley, in the Libyan desert, and in the Peninsula. On the railroad from Ismailiya to Cairo, the authorities have found it necessary to construct long barricades, like our snow-fences, to prevent the drifting sand from burying the track out of sight. In the Nile valley, the fine dry sand has kindly done great service to archæologists; blown into underground galleries used for sepulture, it has preserved intact the artistically decorated walls. Opposite Assouan, Sir Francis Grenfell has recently opened a score of tombs, in which the paintings are as brilliant in color and polish as when completed by the Egyptian workmen centuries before.

As already intimated, loose sand into which the feet sink is confined to the bottom of deep wadis (Tarfa, Es-

Sleh, etc.) inaccessible to high winds, and to banks resting on comparatively level expanses (Gizeh, Ismailiya, etc.) or on the flanks of hills (Jebel Nagous, etc.) In Wadi Feirân, near its entrance into the Gulf of Suez, I noticed a prodigious bank of blown sand, with a rounded summit and regular outline, estimated to be 200 feet high. The bank of sand called Seetzen's Slope at Jebel Nagous, rests on the hillside to the height of nearly 400 feet. The dunes immediately on the sea are comparatively insignificant, eight to twelve feet high at the points reached on my route.

On the southern borders of Lake Timsah (an adjunct of the Suez Canal), a series of dunes extends for more than three miles; some of them rising to the height of 100 feet. At a point about three miles from Ismailiya, between the lake and a shallow lagoon separating it from the desert to the south, the north and south winds meet in an eddy, blowing up the fine yellowish sand in steep slopes, terminating in a long knife-edge ridge. On the steepest inclines the sand has the mobility observed at other localities; there were signs of spontaneous movement down the slope. I tested this sand, but all my efforts to coax sound out of it were futile. The sand beneath the surface was not so dry as that observed in the desert.

The dunes are quite without structure; the sand is uniform in grain and color, from the very edge of the lake up over the top of the ridge. No shrubs or blades of grass find foothold on the arid slope; the surface is everywhere marked by wind-furrows, except where obliterated by the spontaneous sliding mentioned.

The abrading and sculpturing by wind-driven sand

may be seen in many places; on the Nile, inscriptions on granite temples and obelisks are sadly defaced where exposed to this agent; and in the desert most picturesque effects are seen, especially in the sandstone region. On the plains, surface pebbles show a delicate pitting and furrowing caused by the sand-blast, not only on soft gypsum and limestone pebbles, but on crystalline quartz.

Mineralogically the Peninsula is very poor. I collected at different points snowy gypsum, fair selenite in imperfect crystals, and massive white chalk, and noted thin streaks of epidote, small garnets and quartz crystals. The turquoise-mines of Maghâra, which were worked under the Pharaohs, and reopened in 1863, are now abandoned.

The variety, beauty, and fragrance of the shrubs and flowers in the most forbidding and unexpected spots, were to my unprepared mind a remarkable feature. In March I gathered dandelions and daisies at Wadi Useit, also "butter and eggs"; in Wadi Tayyibeh, near saline water, spearmint; and in Wadi Feirân, on the hillsides, sorrel.

The oases with their date-palms, tarfa (or tamarisk) yielding manna, seyâl (or acacia) yielding gum-arabic, gharkad shrubs, and thickets of tall reeds, are veritable islands of fertility in an ocean of desolation. At the Monastery cypresses, oranges, peaches, and vines are cultivated, although 5,000 feet above the sea-level.

Naturalists enumerate a number of large animals that live in the oases of the desert, among them the gazelle, ibex, jackal, and fox. I met with the head of a gazelle and numerous horns of ibexes, and in Wadi Es-Sleh a

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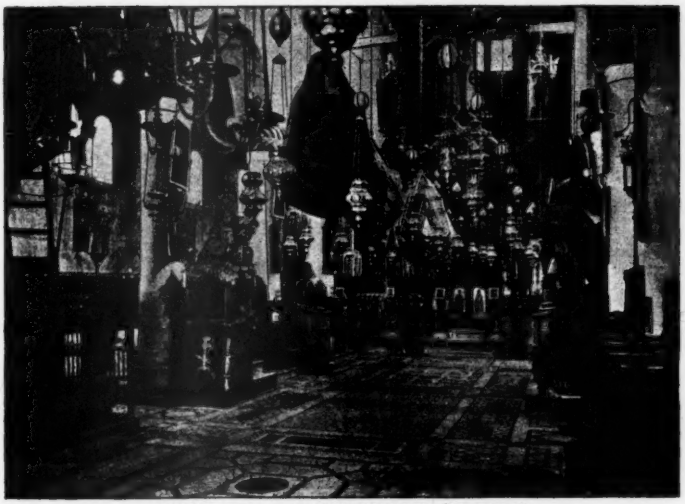

CHURCH OF THE TRANSFIGURATION (INTERIOR).

Bedouin suddenly appeared with two little half-tamed ibexes about fourteen days old; my travelling companion bought them, but they were unable to withstand the novelty of camel-riding, and, though kindly cared for, died within a few days. Their skins were preserved. I noted on the journey a large field-mouse, a small light yellow snake 2½ feet long, and a peculiar kind of a lizard (?) At Assouan I killed an intensely energetic scorpion, and at many places noted chameleons basking in the sun. Of the numerous and curious fish in the Red Sea, I can only say that some of them proved to be excellent food.

Insects were rarely seen in the desert, and only in the neighborhood of water, or in the oases. I observed red and black ants, one large caterpillar, very few flies, many

black beetles, leaving behind them well-defined tracks as they crawled over the fine-grained sand, a few moths, a bee, a grasshopper, many spiders, a lady-bird (so-called), gnats near the sea-coast; and my travelling companion noted fleas. Mosquitoes, so abundant in Cairo, were not seen nor heard. Twice large birds sailed high above our heads. This is the total of animal life met with in my four weeks' journey, excepting camels and goats.

GEOGRAPHICAL NOTES.

THE INTERNATIONAL GEOGRAPHICAL CONGRESS AT BERNE, IN 1891.—This Congress will be held in the week of the 10-15 August, 1891, during the celebration of the Seventh Centenary of the city of Berne.

The general programme embraces five divisions :

1. TECHNICAL GEOGRAPHY, including Mathematical Geography, Geodesy, Topography and Cartography, Instruments, Projection, The Universal Hour, A Prime Meridian, Orthography of Geographical Names, etc.
2. PHYSICAL GEOGRAPHY.—Configuration of the Land, Hypsometry, Hydrography, Maritime Geography, Variations of Climate, Terrestrial Magnetism, Botanical, Zoological and Geological Geography, Volcanoes, Earthquakes, Ethnography, Anthropology, etc.
3. COMMERCIAL GEOGRAPHY.—Population, Emigration, Agriculture, Means of Communication, Commerce, Industry, Production, Commercial Museums, Geographical Statistics.
4. EXPLORATIONS AND VOYAGES.—Travels, Expeditions, Explorations, Colonization, Religious Missions.
5. GEOGRAPHICAL INSTRUCTION AND THE DIFFUSION OF GEOGRAPHY.—Methods of Teaching, Models and Instruments, Wall Maps, Atlases, etc., Globes,

Primary, Secondary and Higher Instruction, Geographical Societies and Publications, Bibliography.

A fully detailed programme will be issued in March, 1891, with a list of communications to be made to the Congress.

THE UNIT MEASURE OF TIME.—Dr. Sandford Fleming, President of Section III. of the Royal Society of Canada, called attention at the opening meeting of the section to the necessity of a unification of time reckoning. There is, in fact, only one time; and, this somewhat revolutionary assertion once established, the way is made clear for a system of time reckoning for the whole globe.

Dr. Fleming referred to the recommendation made by the Washington Conference, in 1884, that time be computed according to the solar passage on a recognized zero meridian of the earth's surface. The unit measure may be defined as the interval of duration extending from one mean solar passage on the antimeridian of Greenwich (selected by the Conference) to the next succeeding passage. This standard unit has been variously called A Universal Day, A Terrestrial Day, A Non-Local Day, A Cosmopolitan Day, A World Day, and a Cosmic Day; all inappropriate names, since the time unit, though identified by the Washington Conference with the civil day of Greenwich, is equally related to all points on the earth's surface, in every latitude and longitude. For this time-unit a name is wanted.

Dr. Fleming suggested that a special committee be appointed to consider the subject. The suggestion

was adopted, and the committee made a report recommending that correspondence be opened, in the name of the Royal Society of Canada, with sister societies in other parts of the world with the view of bringing the subject to their notice, and asking the favor of an expression of opinion regarding it. The desired name is to be sought, by preference, in the classical languages.

The report of the committee was approved by the Royal Society of Canada at the general meeting held May 29, 1890.

It does not appear how the right name is to be chosen, at last; and, before this point can be settled, the term Universal Hour may have established itself in the minds of men.

RECENT CHARTS OF THE U. S. HYDROGRAPHIC OFFICE.

No. 1200.—Pennsylvania: Lake Erie, Erie Harbor.

No. 1205.—East India Archipelago: Singapore and Rhio Straits.

No. 1206.—Singapore New Harbor.

No. 1207.—Dominion of Canada: Quebec Harbor.

No. 1208.—Portugal: Approaches to the River Tagus and the Harbor of Lisbon.

No. 1215.—Flores Island, Rio de la Plata.

No. 1216.—Hawaiian Islands, with Islands and Reefs to the Westward.

No. 1217.—Gulf of St. Lawrence: Caraquette, Shippegan and Miscou Harbors, Bay of Chaleurs.

No. 1218.—Coasts of Peru and Chili: Pisco to Arica.

No. 1219.—Coast of Chili: Arica to Caldera.

No. 1220.—Coast of Chili: Caldera to Valparaiso.

No. 1221.—Samoan Islands: Upolu, Safatu Harbor.

No. 1222.—Coasts of the Argentine Republic: Bahia Blanca to Rio Negro.

No. 1223.—Gulf of California: Pichilinque Harbor (La Paz Bay).

No. 1224.—Azores: Fayal Channel, with Horta and Pim Bays.

No. 1225.—Gulf of Mexico: Laguna de Terminos, Western Entrance.

No. 1226.—Bahamas: Wide Opening (Exuma Sound).

No. 1227.—Bahamas: The Fleeming, or Six Shilling Channel (N. E. Providence Channel) and Ship Channel (Exuma Sound).

No. 1228.—Gulf of Mexico: Laguna de Terminos, Puerto Real Entrance.

No. 1229.—North America: Gulf of California, La Paz Harbor.

No. 1230.—Philippines: Luzon Island, Manila Bay.

No. 1231.—Island of Santo Domingo: Republic of Haïti, Cape Haïti Harbor.

No. 1232.—Chili: Concon Cove.

No. 1233.—Gulf of Mexico: Cay Arenas.

No. 1234.—Gulf of Mexico: Arcas Cays, Campeche Bank.

No. 1235.—Gulf of Mexico: Sisal Anchorage and Reefs.

No. 1236.—Dominion of Canada: The Gut of Canso, with its Southern Approaches, and Chedabucto Bay.

No. 1237.—Dominion of Canada, Cape Breton Island: Great and Little Bras d'Or Lakes, with their Approaches.

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No. 1238.—South America, Guiana: Maroni and Mana Rivers.

BOUNDARY LINE BETWEEN NEW YORK AND NEW JERSEY IN LANDS UNDER WATER.—The Commissioners* appointed by the States of New Jersey and New York, to establish the boundary line between the two States in the lands under water in Raritan Bay, Hudson River, Bay of New York, Kill von Kull and Arthur Kill, or Staten Island Sound, finished their task at the end of the year 1889, and the results arrived at are presented in two Reports, issued in 1887 and 1890 by the New Jersey Boundary Commission.

The agreement, finally adopted on the 12th of October, 1887, as to the lands under water in Raritan Bay, establishes the boundary line as follows:

First. From the "Great Beds light-house," in Raritan bay, north (twenty) 20 degrees sixteen minutes west, true, to a point in the middle of the waters of Arthur Kill or Staten Island Sound, equidistant between the southwesterly corner of the dwelling-house of David C. Butler, at Ward's Point, on Staten Island, in the State of New York, and the southeasterly corner of the brick building on the lands of Cortlandt L. Parker, at the intersection of the westerly line of Water Street with the northerly line of Lewis Street, in Perth Amboy, in the State of New Jersey.

Second. From "Great Beds light-house" south sixty-four degrees and twenty-one minutes east, true (S. 64°

*The Commissioners for New Jersey were: Robert C. Bacot, A. B. Stoney, and George H. Cook, who died Sept. 22, 1889. His place was filled by Col. Edwin A. Stevens. The New York Commissioners were: Mayo W. Hazeltine, Robert Moore and Lieut. G. C. Hanus, U. S. N.

21′ E.), in line with the centre of Waackaack or Wilson's beacon, in Monmouth County, New Jersey, to a point at the intersection of said line with a line connecting "Morgan No. 2" Triangulation Point, U. S. Coast and Geodetic Survey, in Middlesex County, New Jersey, with the "Granite and Iron beacon," marked on the accompanying maps as "Romer stone beacon," situated on the "Dry Romer shoal"; and thence on a line bearing north, seventy-seven degrees and nine minutes east, true, (N. 77° 9′ E.), connecting "Morgan No. 2" Triangulation Point, U. S. Coast and Geodetic Survey in Middlesex County, New Jersey, with said "Romer stone beacon" (the line passing through said beacon and continuing in the same direction) to a point at its intersection with a line drawn between the "Hook beacon," on Sandy Hook, New Jersey, and the Triangulation Point of the U. S. Geodetic Survey known as the Oriental Hotel, on Coney Island, New York; then southeasterly, at right angles with the last-mentioned line, to the main sea.

A second agreement, made on the 23d of December, 1889, settles the boundary line in lands under water in the Arthur Kill, Kill von Kull, New York Bay and the Hudson River, as follows:

Starting from a point (at the conclusion of the boundary line in Raritan Bay), and marked for the purposes of this Agreement, A.

This point is equi-distant between the southwesterly corner of the dwelling-house of David C. Butler, at Ward's Point, on Staten Island, in the State of New York, and the southeasterly corner of the brick building on the lands of Cortlandt L. Parker at the inter-

section of the westerly line of Water Street with the northerly line of Lewis Street, in Perth Amboy, in the State of New Jersey.

The line runs thence in a succession of straight lines through the Arthur Kill, the Kill von Kull, New York Bay and the Hudson River to a point marked "J J," for the purposes of this Agreement.

This point "J J" is at the extreme northern limit of the boundary line in lands under water, and from this point the line runs westerly to a rock which is described in the Report of the New York and New Jersey Boundary Commission of 1883 as marking the eastern end of the boundary line between New York and New Jersey as determined upon by the Royal Boundary Commission of 1769.

The absolute geographical locations of the point at the place of beginning and the point of conclusion are as follows:

Point A (place of beginning).

(Latitude and Longitude not given. Description sufficient.)

Point JJ (place of conclusion).

Latitude.	Seconds in Metres.	Longitude.	Seconds in Metres.
40° 59′ 49″.74 N.	1534.38.	74° 53′ 38″.57 W.	901.46

The labors of the Commissions have put an end to disputes, constantly renewed during two centuries.

GEOGRAPHICAL EXHIBITION.—The Department of Geography of the Brooklyn Institute opened in November a Permanent Exhibition of specimens of Text Books,

Maps, Globes, and other apparatus relating to geographical science and instruction.

The Exhibition, which is free to the public, is under the direction of Mr. Cyrus C. Adams, President of the Department of Geography in the Institute.

Mr. Adams has also taken editorial charge of a monthly magazine, to be published by Goldthwaite Brothers, of New York. The first number will appear in January, 1891.

EXPLORATIONS IN MEXICO.—Under this title, Prof. Angelo Heilprin has brought out in pamphlet form the barometric observations made among the high volcanoes of Mexico, by the expedition under his conduct, and has added a "Consideration of the Culminating Point of the North American Continent."

Four mountains were ascended—Orizaba, Popocatepetl, Ixtaccihuatl, and the Nevado de Toluca,—and Professor Heilprin says, with regard to his measurements: "The fact that all the summits were ascended within a period of three weeks (April 6-27, 1890), were measured with the same instrument, and during a period of atmospheric equability and stability which is offered to an unusual degree by a tropical dry season, renders the possibility of errors of any magnitude almost nil; at any rate, such errors as may have crept in will probably not affect a general comparative result. The points of important difference are: 1. The highest summit of Mexico is not, as is commonly supposed, Popocatepetl, but the Peak of Orizaba (Citlaltepetl, the "Star Mountain"), which rises 700 feet higher (18,200 feet); 2. Ixtaccihuatl, the familiar "White Woman" of the plain of

Anahuac, is but a few hundred feet (about 550) lower than Popocatepetl."

The data for the determination of the height are given, in the case of each mountain, and there seems to have been nothing left undone to arrive at a correct result; but it must be believed that accuracy in the measurement of a mountain is beyond the reach of science, when it is found that observers equally fitted for the work, and supposed to be equally careful in their methods, can only agree to differ.

Professor Heilprin's altitudes are: Orizaba, 18,205 feet; Popocatepetl, 17,523 feet; Ixtaccihuatl, 16,960 feet; and the Nevado de Toluca, 14,954 feet.

The "Consideration" is devoted to an examination of the claim of Mt. St. Elias to the first place among the high points of North America, and closes with these words: "That the mountain closely approximates the giants of the Mexican plateau is almost certain, but it seems equally probable that its true position is after, and not before, the Peak of Orizaba."

SALTILLO.—The London *Athenæum*, which has taken all knowledge for its province, frequently corrects its victims with incorrection.

In a review of a book, "Face to Face with the Mexicans," in the number for November 1, 1890, occurs this sentence:

"Mrs. Gooch, her husband, and two friends took a house in the city of Saltillo, which she might have said is also known as Leone Vicario."

It was, perhaps, because Mrs. Gooch had paid some attention to Spanish, that she did not think it proper

to bestow upon a Mexican city the Italian name of *Leone;* and her natural good sense must have told her that even the Spanish form, Leon Vicario, was not needed to identify the city of Saltillo.

The *Athenæum* would be wiser, if it did not know so much.

THE NICARAGUA CANAL.—The first number of the *Canal de Nicaragua*, a daily paper begun at Managua, Oct. 1, 1890, gives the following classified list of the persons employed in the operations on the Canal:

Engineering Department			7	Officers
Department of Supplies and Transportation			8	"
Paymaster's Department			3	"
Study of the Bay	4	Officers,	5	Men
Police	1	"	20	"
Storehouses	7	"	153	"
Carpenter Shops	1	"	40	"
Breakwater	16	"	140	"
Aqueduct	6	"	80	"
Diamond Drill	4	"	18	"
Transport Service	3	"	22	"
Location of the Rail Road	16	"	40	"
Cultivation			20	"
Telegraph	8	"	20	"
Crews of the Steamboats	8	"	16	"
Rail Road Construction	31	"	994	"
Medical Department	10	"	30	"
Sick	18	"	97	"
Western Division	8	"	25	"
	159	Officers,	1720	Men

The *Canal de Nicaragua* makes the whole number 1849, instead of 1879.

THE WORD "TOBOGGAN."—Prof. W. W. Skeat writes to the London *Academy*, of November 8, 1890,

that he finds in the English-Micmac Dictionary,* compiled by the late Dr. S. T. Rand, the true origin of the word *toboggan*. "The true Micmac form is," he says, "*tobaakun*, accented on *aa*, and meaning a sled or a sledge.

"After much hunting in many books, this is the first time I have ever lighted upon really good authority for this word."

This good authority spells the word *tōbâkŭn*, which ought to be classical Micmac, even for Professor Skeat.

PAPER FOR THE MAPS OF THE ORDNANCE SURVEY.—The *English Mechanic* publishes the following description of the care exercised in printing the Ordnance maps:

Captain C. E. Haynes, R. E., states that the large-scale maps of the Ordnance Survey are printed on double elephant machine-made drawing paper, the expansion of which, due to humidity, is greatest in its length.

Being a hard paper it is necessary to print from the zinc plate on damp sheets, which contract on drying, in length chiefly; consequently, the form on the plate should have a similar elongation. The negative is taken true to scale, and a photographic transfer prepared, after the Southampton method, on Evans' double elephant thin paper, which likewise has its greatest expansion in length.

Previous to transfer to zinc, the transfer is damped

*The title-page of the book is: "Dictionary of the Language of the Micmac Indians, who reside in Nova Scotia, New Brunswick, Prince Edward Island, Cape Breton and Newfoundland. By Rev. Silas Tertius Rand, D. D., L. L. D. (*Sic*). Halifax, N. S.: Nova Scotia Printing Company. 1888."

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until it has expanded to a certain convenient length,—in practice, about ¼ inch beyond its correct size—and quickly passed through the zincographic press; the scraping action of the press increases the length of the transfer by a slight variable amount, which can be determined by experiment. The printer then obtains a stock of paper for printing that has been damped to such a degree of expansion as will contract on drying to the correct scale. In the paper-damping department a stock of printing paper is kept sorted in various degrees of expansion to suit the variable sizes of form on the zinc plates. Every sheet of paper used for printing is measured before being damped, after being damped, and again after being printed. Prints with $\frac{1}{600}$ or .16 per cent. of error in scale are cancelled. It is found that the elasticity of paper—*i. e.*, its capability of regaining its original form on drying after being damped—depends on its maturity, and that the maturity of a sheet depends on its age, and to a certain extent on its position in the ream.

Mont Blanc and the Solar Spectrum.—*Le Galilée*, for October, publishes an extract from a communication made, on the 22d of September, to the *Académie des Sciences*, by M. J. Janssen, the distinguished astronomer.

The observations recorded by M. Janssen in October, 1888, at the Grands Mulets, showed a diminution in the groups of lines in the spectrum in proportion to the elevation at which the observer stood; and this seemed to indicate that these groups would disappear at the limit of the atmosphere and that, consequently, their

appearance in the solar spectrum was not due to the action of the sun's atmosphere. To confirm or to correct these observations by others made at a greater height, M. Janssen, in August, 1890, went up to the top of Mont Blanc, and his experiments completed and confirmed those of 1888. He says: "The result of the observations made between the Eiffel tower and Meudon, those of M. de la Baume-Pluvinel at Candia, those in the laboratory, and finally, those of this year upon Mont Blanc, is that we are led to admit the absence of oxygen in the gaseous envelopes which surmount the photosphere of the sun; or at least, of oxygen so constituted as to exercise upon light the phenomena of absorption produced in our atmosphere, and expressed in the solar spectrum by the systems of lines and bands with which we are acquainted. I consider this to be a truth finally established, from which we may draw certain conclusions with regard to the constitution of the sun's atmosphere."

M. Janssen had noticed in himself, after climbing to the Grands Mulets in 1888, symptoms of fainting that came on with the effort at mental exercise, and these symptoms were only relieved by frequent long-drawn inspirations. The ascent to the summit of the mountain in 1890, was accomplished without bodily exertion, and the freedom from sickness and uneasiness was perfect during the four-days' stay at the top. The appetite was normal, and the intellectual faculties were entire, so long as no draft was made upon the physical strength. This experience possesses value for those who are charged with the conduct of scientific observations at great altitudes.

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Quatrième Congrès International de Navigation Intérieure, Manchester, 1890. *La Navigation Intérieure en Espagne, par M. Andrés de Llauradó, Ingénieur en Chef du District Forestier de Madrid.*

The navigable water-courses of Spain are: on the Mediterranean, the lower region of the Ebro; on the Atlantic, those of the Tagus and the Douro, and the other important rivers that flow into the ocean; and two canals, that of Castile, and the Imperial of Aragon.

The Canal of Castile, begun in 1753 and finished, after many interruptions, in 1849, has three branches: the Northern, 47 miles long from Alar to Serron; the Southern, 34 miles long, from Serron to Valladolid, and the Canal de Campos, 49 miles long, from Serron to Rio Seco. This last is 38 feet wide at the surface of the water and 19 feet at the bottom, and has a depth of 9 feet 4 in.

There are 24 locks on the Northern branch, 18 on the Southern, and 7 on the Canal de Campos.

The Canal of Castile is used only for navigation, and transports annually about 20,000 tons of merchandise, a third of the amount that passed through it fifteen years ago, the railway system along the line of the canal having absorbed, with every year, a larger share of the traffic.

The Imperial Canal of Aragon, which was opened in 1790, begins at a point near the city of Tudela, and ends at Torrero, a short distance below Saragossa. From Torrero two short branches, with a total length of 7½ miles, lead to Miraflores and El Burgo. This canal has lost all its importance as a channel of commerce since the opening (in 1860) of the railway from Saragossa to Pampeluna.

Its chief value is for purposes of irrigation, and as a source of water supply to some towns.

A company, formed in 1851, for improving the navigation of the Ebro between Saragossa and the sea, pushed its work with great energy, and without sparing expense, until 1858, when the river was opened to steam navigation as far as Escatron, 42 miles below Saragossa. The character of the river bed and the deficiency of water made it impossible to do anything beyond Escatron, and the competition with the railroad lines from Saragossa to Absasua and to Pampeluna, from Barcelona to Saragossa, and from Lerida to Tarragona, caused the withdrawal of the steam service on the Ebro, and the utilization of the waters for irrigation became the sole resource of the company.

On the Guadalete the traffic is confined to about 4,000 tons yearly of wines, staves and shooks, and cereals, the railway from Xeres to Cadiz taking the lion's share of the trade.

The supply of water in the Guadalquivir and the slope of its valley (Thalweg) are unfavorable to navigation. The maritime region, which extends from the mouth of the river to the Tabla de las Playas, a little more than half a mile above Alcalá del Rio, is divided by Mr. de Llauradó into two sections; one, 43 miles long, from the Tabla de las Playas to the great bend of the river, and the other from the bend to the mouth, a distance of 33 miles. The influence of the tides is felt throughout the first section and the current of the river is arrested by the inflow.

In the second section, which is essentially maritime, the water is always salt. At Seville the tide rises from

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5 to 8 feet, and the port, which is comprised between the Triana bridge and the Punta de los Remedios, has a depth of water of 20 feet at low tide, with a bottom of mud and sand. Four railway lines unite the port with the stations of the Cadiz and Cordova railroads. If Seville is no longer the centre of the colonial trade, its commerce is still considerable. In 1889 1,272 vessels, 494 of them steamers, with a total tonnage of 277,410, were entered and cleared at the Custom-house.

Mr. de Llauradó remarks that the creation of a maritime canal in the region of the lower Guadalquivir would furnish a sufficient depth of water for purposes of navigation and leave the fresh water of the river to be used for irrigation and the increase of production.

The river traffic of the Guadiana amounts to not more than 13,300 tons yearly; and the other two great rivers on the Atlantic side, the Tagus and the Douro, transport even a smaller quantity of merchandise. All the rivers of Spain are, in fact, torrential in character, and practically unavailable as means of communication, and it is by the railway system that the resources of the country must be developed. At a low stage of the river, the volume of water in the Tagus at Alcántara is represented by a flow of 20 cubic metres a second, but with the rapid freshets of the upper basin the river rises at the bridge of Alcántara to 36, 50, 65, and even 98 feet above low water. Equally remarkable are the freshets of the Nervion, at Bilbao, where the volume of water amounts at a low stage of the river to but 4 cubic metres a second, and increases in time of flood to 1,600 cubic metres.

A great part of Mr. de Llauradó's paper is devoted

to the commercial movement of the ports, situated on the estuaries of the Atlantic and the Biscayan coasts, and but indirectly concerned, therefore, with internal navigation. Of these there are more than 30, the most important being Huelva (near Palos, from which Columbus sailed), and Bilbao. Huelva is the emporium of the Rio Tinto copper-mines, and exports nearly 970,000 tons of ore yearly. In 1863 the total commerce of Bilbao was represented by 139,000 tons of imports, and 78,000 tons of exports; in 1888–89 (12 months) the imports and exports amounted to 4,459,972 tons, mostly exports of iron ore. The harbor of Bilbao has been deepened and improved in many ways under the direction of Mr. E. de Churruca, who is now engaged in constructing an outer harbor, which is to cover an area of more than a square mile. The work will cost $6,000,000.

Lake Copais.—The drainage of the Bæotian lake is now practically completed, the streams that flowed into it having been diverted, and the waters of the lake itself drawn off into the sea.

The area of the land reclaimed may be less than the 100,000 hectares (250,000 acres), at which it is put by the *Deutsche Rundschau für Geographie und Statistik, XII. Jahrg., 12 Heft.;* but it will make a great gain to the kingdom of Greece, and a loss to the lovers of eels.

In Darkest Africa, or the Quest, Rescue, and Retreat of Emin, Governor of Equatoria. By Henry M. Stanley. 2 vols., 8vo.

New York, 1890.

Stanley's book is like a controversial pamphlet, written in haste, and yet of intolerable length. The title seems to imply that the author regards himself as a Knight of the Round Table, but his true prototype is Pyrgopolinices, or Capt. Dugald Dalgetty. The impatience of the public to possess the book excuses much of the composition and, in a measure, some of the details; but, even with allowance for this, the story fatigues the reader. Stanley's interest in his own performances is not to be doubted, and this interest should communicate itself to other men; but few can resist the effect of his iteration. The charity, also, and the piety, which adorn the language, even more than the life, of Mr. Stanley, express themselves, like the notes of a street organ, in the least congenial places; and the reader, less spiritually minded than the Father of the Congo, finds himself lost in a maze of unrelated ideas. The pen-portraits, and descriptions of character, and the conversations reported lack deliberation and purpose, and add no real element to the work.

There is too much space devoted to the camp at Yambuya, and even the terrors of the Great Central African Forest seem to be exaggerated, though, in describing these, Stanley writes with an approach to naturalness and simplicity.

The geographical discoveries of the expedition were: the Great Forest, estimated by the explorer to cover more than 300,000 square miles; the Pygmies, the Ruwenzori mountains, and the Albert Edward lake.

It is to be regretted that Stanley was too much absorbed in his unselfish enterprise to remember that others had preceded him in the discovery of the Pygmies

and the Ruwensori and the Great Forest. The marches through the Forest and the naming of the Albert Edward lake are his own, and he, alone among travellers, recognizes in the Pygmies the oldest aristocracy on earth; a clear injustice to the Cranes.

Not less than three hundred pages are devoted to Emin Pasha, his position and difficulties, the discussions with him, his irresolution and his ingratitude in refusing to be rescued; but the one page telling in plain English, why Stanley went to the Albert Nyanza, is not to be found.

In Darkest Africa is a record that shows once more its author's energy, his contempt of danger, and his fitness for the command of wild men, but it does not increase respect for his character.

Extinction of the White Rhinoceros.—Mr. Selous, who has done a great deal of travelling and exploration in South Africa, expresses himself as follows, in the London *Field* of August 16th:

"It was within a mile of this spot that, two years previously, (*i. e.*, in 1883) I shot two white rhinoceroses (*Rhinoceros simus*), the last of their kind that have been killed (and perhaps, that *ever will be killed*) by an Englishman. They were male and female, and I preserved the skin of the head and the skull of the former for the South African Museum in Cape Town, where they now are. I shall never cease to regret that I did not preserve the entire skeleton for our own splendid Museum of Natural History at South Kensington; but when I shot the animal I made sure I should get finer specimens later on in the season. However, one

thing and another prevented my visiting the one spot of the country where I knew that a few were still to be found, and now those few have almost, if not quite all, been killed; and, to the best of my belief, the great white, or square-mouthed, rhinoceros, the largest of modern terrestrial animals after the elephant, is on the very verge of extinction, and in the next year or two will become absolutely extinct. If in the near future some student of natural history should wish to know what this extinct beast really was like, he will find nothing in all the museums of Europe and America to enlighten him upon the subject but some half-dozen skulls and a goodly number of the anterior horns." Mr. Selous stands, like Sir Bedivere

> This way and that dividing the swift mind,

between grief for the extinction of the rhinoceros and sympathy with the student that is to be; but let him take comfort. He, at least, will live in a kind of history as the Englishman who bagged the last pair of white rhinoceroses, and wept the while, not as a rhinoceros weeps.

The Pacific on the East Coast of Japan.—Admiral Geo. E. Belknap, U. S. N., read a paper in October last, before the Asiatic Society of Japan, on "The Depth of the Pacific on the East Coast of Japan, with a Comparison of Other Oceanic Depths."

The subject of oceanic depths has been treated by Professor Dana, in the *American Journal of Science*, for March, 1889, but Admiral Belknap, who commanded the *Tuscarora* expedition in 1874, gives some interesting details of his own experience.

The *Tuscarora* left Yokohama in June, 1874, to survey a cable route from a point on the east coast of Japan on a great circle running through the Aleutian chain of islands, and ending at Cape Flattery at the entrance of Puget Sound. At 100 miles from the coast a sounding was made in 3,427 fathoms, the water having deepened more than 1,800 fathoms in a run of 30 miles.

The next cast was made in the Kuro Siwo, or Black Stream, and the wire broke when 4,643 fathoms had run out, without reaching bottom. The ship was headed in shore and the great circle was taken up again in latitude 40° N. Three successive casts of the lead within 80 miles gave 3,439, 3,587 and 3,507 fathoms. The next seven soundings at intervals of 40 miles apart showed 4,340, 4,356, 4,041, 4,234, 4,120, 4,411, and 4,655 fathoms. Considering these great depths, Admiral Belknap concluded that the great circle route would have to be abandoned, and search made for a new line.

He accordingly put back to Hakodate, and, starting again on the 30th of June, skirted the Kurile Islands as far as latitude 48°, and then laid a course for Agattu, in the Aleutian group.

It was found that the water deepened rapidly on this line also, a depth of 3,754 fathoms being reached 110 miles west of Cape Lopatka. Between this point and the Aleutian Islands a ridge rises to within 1,777 fathoms of the surface, with soundings of 4,037 fathoms at the eastern base of the ridge.

This series of soundings developed, therefore, a trough of extraordinary depth and extent along the eastern coast of Japan and the Kurile Islands and

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proved the Kuro Siwo "to be of greater extent than any similar or approaching depression yet found in any other region of the great oceans."

From the great mass of data now brought together on the subject of oceanic depths, Admiral Belknap ventures to formulate with singular precision the proposition that, "*as a rule, the deepest water is found, not in the central parts of the great oceans, but near, or approximately near the land, whether of continental mass or island isolation.*"

A review of the work done shows that the *Tuscarora* found the first depths of 4,000 fathoms and approaching 5,000 fathoms; that the *Challenger* discovered the great depression of considerably more than 4,000 fathoms (4,475) in the bed of the North Pacific, near Guam; that the U. S. Coast Survey steamer *Blake* developed the 4,561 fathom depth in the North Atlantic, near Porto Rico, at a locality first indicated by the *Challenger's* soundings; and that H. M. Surveying ship *Egeria* found depths of 4,428, 4,295 and 4,530 fathoms, in 1888 and 1889, in the neighborhood of the Friendly and Cook Islands, in the South Pacific.

OBITUARY.

Sir Richard F. Burton.—This famous traveller died at Trieste, on the 20th of October last, in the seventieth year of his age. He was born in Hertfordshire, England, on the 19th of March, 1821, and passed his early life on the continent. At the age of nineteen, he was entered at Trinity College, Oxford, but was rusticated after no long time, and then obtained a cadetship in the Indian army. In India, where he remained

for seven years, he devoted himself to the study of Oriental languages. He returned to England in 1849, and carried out in 1853 the dangerous enterprise of visiting Mecca and Medina in the disguise of a true believer. He next penetrated, in 1854, to the city of Harar, in Somaliland, and attempted to reach it again the following year, setting out with Lieutenant Speke from Berbera; but the party was attacked by night, and of the four Englishmen only one, Lieutenant Herne, got back unhurt. Lieutenant Stroyan was killed, Burton received a javelin-thrust in the mouth, and Speke escaped as by a miracle, with unnumbered wounds from war-clubs and spears.

The journey to the lake regions of Central Africa, which resulted in the discovery of Lake Tanganyika, was undertaken in company with Speke in 1856, and extended over more than two years.

These three achievements—the pilgrimage to Mecca, the visit to Harar, which no other European had reached, and the discovery of Tanganyika—establish the right of Burton to a foremost place among explorers; and never was a man better equipped than he, with his force of character and his accomplishments, physical and intellectual, for the adventurous career he had chosen. He visited and described many portions of the Eastern Continent, as well as Brazil and Utah,* in the New World, and his books show the man as he

* In the preface to *The City of the Saints* (1861), Burton frees his mind in a characteristic way concerning the "Anglo-Scandinavian" theory: "The word is proposed," he says, "by Dr. Norton Shaw, Secretary to the Royal Geographical Society, and should be generally adopted. Anglo-Saxon is to Anglo-Scandinavian what Indo-Germanic is to Indo-European; both serve to humour the absurd pretensions of claimants whose principal claim to distinction is pretentiousness."

was, a truthful, cool-headed, accurate observer, possessed of immense information.

His position as British Consul, first at Fernando Po, and afterwards in succession at the port of Santos, in Brazil, at Damascus, and at Trieste, afforded leisure for the composition of three works—a *Translation of Camoens*, *The Book of the Sword* (left unfinished), and the *Translation of the Arabian Nights.*

Burton had extraordinary qualifications for the work of the translator. He possessed the very idiom and the mode of thought, as well as the words, of the foreign peoples he had studied, and his rendering of Camoens, though it too often fails as poetry, is wonderful for closeness and accuracy.

His *Arabian Nights*, unreservedly praised by Orientalists, will remain a sealed book to most men, because of its plainness of speech and consequent high price, whenever a copy finds its way into a catalogue of works, pleasantly called *Facetiæ.* Burton was moved to undertake this translation—so he declared and undoubtedly believed—by the consideration that the study of the true *Arabian Nights* in English would enable his countrymen to understand the Mohammedan mind, and to deal more intelligently with the races that profess the faith of Islam.

To dispose of this consideration it is only necessary to ask one's self how far a person, not a genius, unacquainted with Greek or Latin, can enter into the spirit of the Greek or the Roman literature and life by the perusal of English translations of the classics.

There is no royal road to learning. Those who have it seriously at heart to know how Mohammedans live

and think must learn the Arabic language; and this, *pace* Burton, very many of his countrymen have done and do.

The translation of the *Arabian Nights*, even more than his papers on anthropological subjects and many passages in his books of travel, bears testimony to the existence in Burton of a morbid proclivity, like that which marked the mind of Richard Payne Knight.

ANTONIO RAIMONDI.—Mr. Raimondi, a corresponding member of this Society since 1877, died in October last at Lima, in the sixty-fifth year of his age. A Milanese by birth, he had lived in Peru for forty years, devoting himself to the exploration of the country and the study of its geography, natural history and geology.

In 1873 he brought out a volume in quarto on the Department of Ancachs and Its Mineral Riches, the expense of publication being borne by Mr. Henry Meiggs; and in 1874 appeared the first volume, entitled *Parte Preliminar*, of his great work, *El Perú*, the cost of which was assumed by the nation. This preliminary part describes the author's purpose and method, and tells the story of his journeys. The second and third volumes, issued respectively in 1876 and 1880, relate the history of geography in Peru from the days of Pizarro to the year 1878, and bear testimony throughout their 1,000 pages, to Mr. Raimondi's learning and sagacity and extraordinary industry. The progress of the war with Chile caused the suspension of the work after 1880, and it is, perhaps, unnecessary to believe, with Mr. C. R. Markham,* that "among other wanton acts of vandalism

**Proceedings* of the Royal Geographical Society, December, 1890, pp. 764-765.

perpetrated by the Chilians, it is understood that a whole edition of the fourth volume of the work of Raimondi was destroyed."

El Perú did not wholly absorb its author's energies. A book on the minerals of Peru, prepared for the Paris Exposition, was published in 1878; and he made many contributions to scientific periodicals.

HERMANN BERGHAUS.—Mr. Justus Perthes, in a circular letter, dated December 3, gives information of the death of Hermann Berghaus on the morning of that day at Gotha.

The loss, so deeply felt by Mr. Berghaus's associates in the Institute at Gotha, is almost personal to every one who is interested in geographical science, but for him there is nothing to regret. His life-long labors for the enlightenment of mankind have been crowned by a peaceful death, in the fullness of time.

TITLES OF PAPERS IN GEOGRAPHICAL JOURNALS.

EDINBURGH.—*The Scottish Geographical Magazine.*

The Physical Features of Brazil in their Relation to the Commercial and Industrial Development of the Country (by James W. Wells)—On the Present State of the Ordnance Survey and the Paramount Necessity for a Thorough Revision (by Henry T. Crook)—British Association, 1890: Report to Council (by A. Silva White)—The Partition of Africa (Arthur Silva White)—The Mapping of the World (John George Bartholomew)—Memorial of the Council of the Royal Scottish Geographical Society to

the Commissioners appointed by Parliament in the Universities (Scotland) Act, 1889—A Railway through Southern Persia (Maj.-Gen. Sir F. Goldsmid)—Spanish Honduras (Will Pilcher)—The Relief of Emin Pasha, A Review of Mr. Jephson's *Emin Pasha and the Rebellion at the Equator.*

GOTHA.—*Petermanns Mitteilungen.*

Involuntary Migrations in the Pacific Ocean—The Algerian Atlas Range—The New Limits in Africa—The Arabs on the Nile Lakes—The Report on the Present Position of the Panama Canal Company—The Beginning of the World and Geological Time—Avalanches in the Riesengebirge—Historical Development of the Knowledge of the Greenland Inland Ice—Plan of an Expedition to Eastern Greenland—Communications from North Borneo—Shorelines and Terraces—A Journey in German New Guinea—The Work on the Nicaragua Canal—The Question of the Many Years' Periods of Fluctuation in the Level of Bodies of Water—Hugo Zöller's Expedition to the Finisterre Mountains (German New Guinea)—On a Journey to the Eastern Slope of the Andes between the Rio Diamante and the Rio Negro (Argentine Republic)—The Borderland of Language in Schleswig—Brown's Travels in the Musgrave Mountains, South Australia—The Name of the Highest Mountain in the World—An Attempt to Sum up the Scientific Results of Stanley's March Through

Africa—The Molveno Lake in the Tyrol—Nordenskiöld's Fac-simile Atlas—The New Edition of Stieler's Hand-Atlas.

Ergänzungsheft, Nr. 99.

East Equatorial Africa, between Pangani and the Newly Discovered Rudolf Lake, by v. Höhnel.

LISBON.—*Sociedade de Geographia de Lisboa.*

The Library : Part I., Printed Works—Publications.

LONDON.—*Royal Geographical Society, Proceedings.*

The Karun River and the Commercial Geography of Southwest Persia—Across Luristan to Ispahan—Lieut. H. B. Vaughan's Recent Journey in Eastern Persia—Notes on Yoruba and the Colony and Protectorate of Lagos, West Africa—Zambezia, the New British Possession in Central South Africa—The Partition of Africa—British Central Africa—A Journey from Lake Nyassa to the Great Loangwa and Upper Zambezi Rivers.

MADRID.—*Sociedad Geográfica, Boletin.*

The Paris Geographical Congress and Exhibition, in 1889—The Portuguese in South Africa and their Discovery of the Chambezi, the Source of the Congo, in 1796—The Polish Traveller Rogozinski, in Fernando Po—The Future of the Spanish Language (in comparison with the other principal tongues) from a Geographical and Statistical Point of View—The Cadastre in Spain—Rivers of Venezuela and Colombia : Unpublished Accounts Collected by Cesáreo Fernandez Duro—The Spanish Pyrenees—Note on Meteorological Work in Spain—A

New Map of the Zambezi (without date, but evidently made not long after 1610)—The Spanish Missions to Fernando Po and Its Dependencies.

PARIS.—*Société de Géographie, Compte Rendu.*

Climatology (the *Klima-Schwankungen* of Brückner)—Notes on European and Asiatic Russia—Bonvalot in Central Asia—Exploration of the Upper Yang-Tze—The Veddahs of Ceylon—Morocco—The Navigation of the Niger—Itinerary and Map of Fourneau's Mission from the Ogowe to El Campo—Vancouver, British Columbia—Exploration of the Valley of the Orinoco—Coudreau's Travels in Guiana—M. Thouar in South America—Exploration of the Pilcomayo—Rosario and the Development of its Port—The Arctic: Letters from Schwatka and Nordenskiöld—The Cliff Dwellers of the Sierra Madre—M. Cholet's Explorations in the Gaboon-Congo Region—M. Rabot's Travels in the Petchora Basin, the Northern Ural and Western Siberia—State of the Initial-Meridian Question—The Future of the Solid Earth—Letter concerning Captain Grombtchevsky's Travels in Central Asia—The Frontier between Tonkin and China—Map showing the Distribution of Wealth in France and the number of Children to the Family in each Department—Maps of the Parapanema and Itapetininga Rivers and of the Geology and Meteorology of S. Paulo, Brazil—Unification of the Hour and the Initial Meridian.

Bulletin.

Report on the Competition for the Annual Prize, 1890—The North African Routes to the Sudan—From Lima to Iquitos—The Resources of Central Asia as a Field for Russian Colonization—Notes on Tibet—The Telegraphic Conference at Paris on the Subject of the Universal Hour.

ROME.—*Società Geografica Italiana.*

Captain Casati at Rome—Itinerary in Somaliland—Area of the Inhabited Earth according to Strabo—The Italian Emigrant's Guide to Chile—Legend of the Jurupary—The Somali, Galla and Harari Spoken Tongues—Letter from Dr. Traversi—Two Excursions in the Dembelas Country (Ethiopia)—Ethnographic Study on the Population of the Caucasus.

VIENNA.—*Mittheilungen der Kais. Königl. Geographischen Gesellschaft.*

The Highland of Ulnia or Zeitun, (Eastern Cilicia)—The Southern Watering-Places on the Austrian Coast—The Subterranean Water-Courses of Carniola—The Panama Canal Company—The Profit of the Sumatra Coal Fields—The Date (Time Reckoning) in the Philippines.

WASHINGTON—*National Geographic Magazine.*

The Arctic Cruise of the U. S. S. *Thetis* in the Summer and Autumn of 1889—The Law of Storms, Considered with Special Reference to the North Atlantic—The Irrigation Problem in Montana.

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WASHINGTON LETTER.

WASHINGTON, DECEMBER 20, 1890.

THE UNITED STATES CENSUS.—The population of the United States (Alaska and whites in Indian Territory excepted), as finally determined, November 25, is 62,622,250; a difference of 141,710 from the statement of October 28. The enumerations are:

NORTH ATLANTIC DIVISION.

	1890.	1880.
Maine	661,086	648,936
New Hampshire	376,530	346,991
Vermont	332,422	332,286
Massachusetts	2,238,943	1,783,085
Rhode Island	345,506	276,531
Connecticut	746,258	622,700
New York	5,997853	5,082,871
New Jersey	1,444,933	1,131,116
Pennsylvania	5,258,014	4,282,891
	17,401,545	14,507,407

SOUTH ATLANTIC DIVISION.

	1890.	1880.
Delaware	168,493	146,608
Maryland	1,042,390	934,943
Dist. of Columbia	230,392	177,624
Virginia	1,655,980	1,512,565
West Virginia	762,794	618,457
North Carolina	1,617,947	1,399,750
South Carolina	1,151,149	995,577
Georgia	1,837,353	1,542,180
Florida	391,422	269,493
	8,857,960	7,597,197

NORTHERN CENTRAL DIVISION.

	1890.	1880.
Ohio	3,672,306	3,198,062
Indiana	2,193,404	1,978,301
Illinois	3,826,351	3,077,871
Michigan	2,093,889	1,636,937
Wisconsin	1,686,880	1,315,497
Minnesota	1,301,826	780,773
Iowa	1,911,896	1,624,615
Missouri	2,679,104	2,168,380
North Dakota	182,709	36,909
South Dakota	328,808	98,268
Nebraska	1,058,010	452,402
Kansas	1,427,096	996,096
	22,362,279	17,364,111

SOUTHERN CENTRAL DIVISION.

	1890.	1880.
Kentucky	1,858,635	1,648,690
Tennessee	1,767,518	1,542,359
Alabama	1,513,017	1,262,505
Mississippi	1,289,600	1,131,597
Louisiana	1,118,587	939,946
Texas	2,235,523	1,591,749
Indian Territory		
Oklahoma	61,834	
Arkansas	1,128,179	802,525
	10,972,893	8,919,371

WESTERN DIVISION.

	1890.	1880.
Montana	132,159	39,159
Wyoming	60,705	20,789
Colorado	412,198	194,327
New Mexico	153,593	119,565
Arizona	59,620	40,440
Utah	207,905	143,963
Nevada	45,761	62,266
Idaho	84,385	32,610
Alaska		
Washington	349,390	75,116
Oregon	313,767	174,768
California	1,208,130	864,694
	3,027,613	1,767,697

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Statistics are not yet available for exhibiting the sources of abnormal increment in some of the States.

The average increase of population in the north and south Atlantic divisions from 1880 to 1890 is 18 per cent. ; in the northern and southern central divisions, 25.65 per cent., and in the western division 70.22 per cent.; or, combining the northern and southern central with the western division, 40.52 per cent.

In the decade from 1870 to 1880 the average increase was: in the north and south Atlantic divisions, 23.87 per cent., in the northern and southern central divisions, 36.19 per cent., and in the western division, 78.46 per cent.; or, combining the three latter, 50.28 per cent.

The absolute increase of the population between 1880 and 1890 was 12,466,467, and the percentage of increase was 24.85. Between 1870 and 1880 the percentage of increase was 30.08. In explanation of this unfavorable, or, popularly speaking, disappointing showing, the Superintendent of the census claims that the census of 1870 was inaccurately taken in the southern States, and that the total population at that date was at least 40,000,000, instead of 38,558,371. Mr. Walker, who was Superintendent of the census of 1880, made a statement at the recent meeting of the National Academy of Sciences regarding the probable amount of error in the enumeration of the colored people of the South in 1870. From the best figures he could obtain, he said it was far from being 1,500,000 out of the way, or even a large proportion of that sum. By a series of computations he explained that the true figures would be between 5,200,000 and 5,400,000, instead of 4,880,000

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as returned, and the probable error, therefore, between 320,000 or 520,000, instead of 1,500,000.

The relative rank and changes of rank from 1880 are as follows :

1890.	1880.
1. New York.	1. New York.
2. Pennsylvania.	2. Pennsylvania.
3. Illinois.	3. Ohio.
4. Ohio.	4. Illinois.
5. Missouri.	5. Missouri.
6. Massachusetts.	6. Indiana.
7. Texas.	7. Massachusetts.
8. Indiana.	8. Kentucky.
9. Michigan.	9. Michigan.
10. Iowa.	10. Iowa.
11. Kentucky.	11. Texas.
12. Georgia.	12. Tennessee.
13. Tennessee.	13. Georgia.
14. Wisconsin.	14. Virginia.
15. Virginia.	15. North Carolina.
16. North Carolina.	16. Wisconsin.
17. Alabama.	17. Alabama.
18. New Jersey.	18. Mississippi.
19. Kansas.	19. New Jersey.
20. Minnesota.	20. Kansas.
21. Mississippi.	21. South Carolina.
22. California.	22. Louisiana.
23. South Carolina.	23. Maryland.
24. Arkansas.	24. California.
25. Louisiana.	25. Arkansas.
26. Nebraska.	26. Minnesota.
27. Maryland.	27. Maine.
28. West Virginia.	28. Connecticut.
29. Connecticut.	29. West Virginia.
30. Maine.	30. Nebraska.
31. Colorado.	31. New Hampshire.
32. Florida.	32. Vermont.
33. New Hampshire.	33. Rhode Island.
34. Washington.	34. Florida.
35. Rhode Island.	35. Colorado.

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1890.	1880.
36. Vermont.	36. District of Columbia.
37. South Dakota.	37. Oregon.
38. Oregon.	38. Delaware.
39. District of Columbia.	39. Utah.
40. Utah.	40. Dakota.
41. North Dakota.	41. New Mexico.
42. Delaware.	42. Washington.
43. New Mexico.	43. Nevada.
44. Montana.	44. Arizona.
45. Idaho.	45. Montana.
46. Oklahoma.	46. Idaho.
47. Wyoming.	47. Wyoming.
48. Arizona.	
49. Nevada.	

Seven States, viz.: New York, Pennsylvania, Missouri, Michigan, Iowa, Alabama and Wyoming retain the positions they had in 1880. The most marked changes are those of Texas, which rises from No. 11 to 7; Minnesota, from 27 to 20; Nebraska, from 30 to 26; Colorado, from 35 to 31; Washington, from 42 to 34; Vermont and Nevada drop six points each; Maryland, Delaware and Arizona, four each, and Kentucky, three.

The following table exhibits the rank of the thirteen original States in 1790 and 1890:

1790.	1890.
1. Virginia.	15. Virginia.
2. Pennsylvania.	2. Pennsylvania.
3. North Carolina.	16. North Carolina.
4. Massachusetts.	6. Massachusetts.
5. New York.	1. New York.
6. Maryland.	27. Maryland.
7. South Carolina.	23. South Carolina.
8. Connecticut.	29. Connecticut.
9. New Jersey.	18. New Jersey.
10. New Hampshire.	33. New Hampshire.
11. Georgia.	12. Georgia.
12. Rhode Island.	35. Rhode Island.
13. Delaware.	42. Delaware.

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The work of establishing the population of the minor civil divisions of the country is well under way, and a Bulletin, containing the population of all cities and towns of 2,500 and over, is now in the hands of the printer. It will be followed immediately by a third Bulletin giving the population for each State in detail for all civil divisions of whatever size. It is stated that the returns will exhibit an unusual migration of the agricultural population to the cities, a gain in fact of no less than sixty per cent. in ten years.

Some of the most conspicuous features gathered by the eleventh census, and announced in preliminary statements, subject to final revision, deserve attention:

United States debt: The Government paid off $999,141,205.15 of its debt in ten years, or more than one-half of the indebtedness as it existed in 1880. It now owes (Dec. 1, 1890) $873,435,939.66—considerably less than the sum paid in ten years.

State debts: The States paid off debts to the amount of $72,163,985.05 and now owe $132,336,689.44, as against $204,500,674.49 in 1880.

County debts have increased from $125,621,455, in 1880, to $145,693,840, in 1890; but sinking funds, cash and other available resources reduce that sum to $115,224,885.

Municipal debts: The total of municipal debts in 1880 was $695,494,741, and in 1890, $745,919,786; but the sinking funds had increased from $115,158,742 to $147,181,191; 779 cities in 1880 reported debt in excess of resources amounting to $502,267,198; in 1890, 746 cities reported $469,788,951. But 112 cities reported resources of $14,415,011 in excess of debt as against 79

cities reporting in 1880 $1,116,239 in excess. The reduction in annual interest charges has been $3,045,740. The rate of interest on municipal debts has fallen in the New England, Middle and Western States, and increased in the Southern States. Of the total debt, 96 per cent. is bonded.

Production: The production of pig-iron during the year ending June 30, 1890, aggregated 9,579,779 tons (of 2,000 pounds) as compared with 3,781,021 tons produced in 1879–80, and 2,052,821 in 1869–70. The Southern States produced 1,780,909 tons of the 1889–90 aggregate, of which one half came from Alabama. The United States is probably to day the leading producer of pig-iron in the world. The total production of steel in the form of ingots and direct castings aggregates 4,466,926 tons in 1889–90 as against 1,145,711 tons in 1879–80. The production of Bessemer steel rails has increased in the same period from 741,475 to 2,036,654 tons. There are steel works in nineteen States, Pennsylvania continuing to occupy the position of leading producer, with 62 per cent. of the product. Illinois is second in rank, and Ohio, third; although the increase in the latter State nearly equalled that of Pennsylvania. Steel manufacture has been abandoned in Rhode Island and Vermont.

In the case of the following industries special reports will be made by expert special agents charged with this duty as noted in each case:

Chemical industry, Henry Bower, of Philadelphia, Pa.

Clay and pottery products, Henry T. Cook, of Trenton, N. J.

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Coke and glass, Joseph D. Weeks, of Pittsburgh, Pa.

Cotton goods, Edward Stanwood, of Boston, Mass.

Distilled spirits used in the arts, manufactures and in medicine, Henry Bower, of Philadelphia, Pa.

Electrical apparatus and appliances, their manufacture and uses, Allen R. Foote, of Washington, D. C.

Manufactured gas, George W. Graeff, Jr., of Philadelphia, Pa.

Iron and steel, William M. Sweet, of Philadelphia, Pa.

Mixed textiles, Peter T. Wood, of Newark, N. J.

Printing, publishing, and periodical press, S. D. N. North, of Boston, Mass.

Salt, Henry Bower, of Philadelphia, Pa.

Ship-building, Charles E. Taft of Little Rock, Ark.

Silk and silk goods, Byron Rose, of New York City.

Wool and worsted, S. D. N. North, of Boston, Mass.

The following is a list of those in charge of the general divisions of the census work:

Geography, Henry Gannett.

Population, William C. Hunt.

Vital statistics, Dr. John S. Billings.

Church statistics, Dr. Henry K. Carroll.

Educational statistics, James N. Blodgett.

Pauperism and crime, Rev. Fred. N. Wines.

Wealth, debt and taxation, T. Campbell-Copeland.

National and State finances, J. K. Upton.

Farms, homes and mortgages, George K. Holmes, John S. Lord, and John D. Leland.

Agriculture, John Hyde and Mortimer Whitehead.

Manufactures, Frank R. Williams.

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Mines and mining, David T. Day.
Fish and fisheries, Charles W. Smiley.
Transportation, Prof. Henry C. Adams.
Insurance, Charles A. Jenney.
Statistics of special classes, Dr. John S. Billings.
Alaska, Ivan Petroff.
Statistics of Indians, Thomas Donaldson.
Social statistics of cities, Harry Tiffany.
Accounts of farms, homes and mortgages, Charles L. Curtiss.

It is the intention to publish, in connection with the census volumes, a new Statistical Atlas of the United States, which shall show by a series of maps and diagrams not only the progress of the country for the last decade, but for the century.

The report on Vital Statistics bids fair to be of more value to the country and to scientific inquiry than any heretofore prepared. The Superintendent says: "By far the greater portion of the work has been upon special inquiries outside the census year, but of the highest importance and value, consisting in part of the collection of data from the records of local boards of health during the five years immediately preceding the census year. The places selected for this inquiry were the cities of Baltimore, Boston, Brooklyn, Chicago, Cincinnati, New York, Philadelphia, St. Louis, the District of Columbia, and the whole of New Jersey."

A special inquiry of the Vital Statistics division concerns matters relating to Hebrew families throughout the United States.

Another special investigation decided upon is in the line of horticulture, including nurseries, florists, and

farms, truck farms and semi-tropic fruits; also, a census of farmers' organizations. It is thought that this enumeration will account for at least twenty-five thousand organizations.

The publications of the Census Office for general distribution consist thus far of a series of *Bulletins*, in semi-quarto form, which are best described by citing their titles, viz.:

No. 1. Feb. 10, 1890. List of supervisors' districts.

" 2. Dec. 20, 1889. List of aquatic animals which are sought by fishermen. (The office has published also a dictionary of fishes, prepared by Mr. C. W. Smiley.)

" 3. March 1, 1890. List of industries, the collection of the statistics of which has been withdrawn from enumerators, and assigned to experts.

" 4. April 23. Names and addresses of supervisors.

" 5. May 15. Statement of the character of the inquiries in relation to recorded indebtedness of private individuals and corporations.

" 6. Aug. 4. Financial condition of counties, by T. Campbell-Copeland. (With symbolic maps to illustrate the geographical distribution of county debt and available resources.)

" 7. Aug. 6. Indebtedness of States in 1880 and 1890, by J. K. Upton.

" 8. Aug. 8. Product and value of Slate Mining, by Wm. C. Day.

" 9. Aug, 20. Production of Pig-iron, by Frank R. Williams.

" 10. Aug. 22. Statistics of Quicksilver, by J. B. Randall.

" 11. Aug. 23. Rapid Transit in Cities, by Charles H. Cooley.

" 12. Oct. 30. Population of the United States, by States and Territories.

" 13. Oct. 31. Production of Steel, by William M. Sweet.

" 14. Nov. 4. Financial Condition of Municipalities, by T. Campbell-Copeland.

" 15. Nov. 7. Progress Report on the Census of Alaska, by Ivan Petroff.

PAN-AMERICAN CONFERENCE:—*Results.* Among the recommendations of the recent Conference of American Republics, was the following:

Resolved: That the Governments here represented shall unite for the establishment of an American International Bureau, for the collection, tabulation, and publication, in the English, Spanish, and Portuguese lan guages, of information as to the productions and commerce, and as to the customs, laws, and regulations of their respective countries; such bureau to be maintained in one of the countries for the common benefit and at the common expense, and to furnish to all the other countries such commercial statistics and other useful information as may be contributed to it by any of the American republics. That the Committee on Customs regulations be authorized and instructed to furnish to the Conference a plan of organization and a scheme for the practical work of the proposed bureau.

In accordance with this resolution the committee, which consisted of Messrs. José Alfonso, M. Romero, N. Bolet Peraza, Salvador de Mendonça, H. G. Davis and Charles R. Flint, submitted a series of recommen-

dations. Among others: That the countries represented shall form an association under the title of "The International Union of American Republics for the prompt collection and distribution of commercial information." That the International Union shall be represented by a bureau in Washington, under the supervision of the Secretary of State. That this bureau shall be called "The Commercial Bureau of the American Republics," and that its organ shall be a publication to be entitled "Bulletin of the Commercial Bureau of the American Republics." That the contents of the Bulletin shall consist of existing customs tariffs; regulations affecting the entrance and clearance of vessels and the importation and exportation of merchandise; quotations from commercial and parcel-post treaties; statistics of external commerce and domestic products. That the Bureau shall at all times be available as a medium of communication for persons applying for reasonable information in regard to customs tariffs and regulations, and to the commerce and navigation of the American republics. That the expense of maintaining the Bureau shall be borne proportionately by the several Governments represented in the Union, the first assessment being as follows:

Countries.	Population.	Tax.	Countries.	Population.	Tax.
Hayti	500,000	$187.50	Honduras	350,000	$131.25
Nicaragua	200,000	75.00	Mexico	10,400,000	3,900.00
Peru	2,600,000	975.00	Bolivia	1,200,000	450.00
Guatemala	1,400,000	525.00	United States	50,150,000	18,806.25
Uruguay	600,000	225.00	Venezuela	2,200,000	825.00
Colombia	3,900,000	1,462.50	Chili	2,500,000	937.50
Argentina	3,900,000	1,462.50	Salvador	650,000	243.75
Costa Rica	200,000	75.00	Ecuador	1,000,000	375.00
Paraguay	250,000	93.75			
Brazil	14,000,000	5,250.00	Total	96,000,000	36,000.00

That modifications of plans may be made by the vote of a majority of the members of the Union; and finally that the Union shall continue in force during ten years, and thereafter for successive period of ten years each, unless, twelve months before the expiration of any ten years' period, a majority of members officially notify the Secretary of State of their wish to terminate it.

In pursuance of these recommendations of the Conference the following appropriation was agreed to at the last session of Congress:

For the organization and establishment, under the direction of the Secretary of State, of "The International Union of American Republics for the prompt collection and distribution of commercial information," thirty-six thousand dollars, and the sums contributed by other American Republics for this purpose, when collected, shall be covered into the Treasury.

The Secretary of State has already organized the Commercial Bureau of American Republics in accordance with the recommendations of the Conference. Mr. William E. Curtiss is director, assisted by Dr. José I. Rodrigues, Carlos Federico Adams Michelena, Ricardo Villafranca, and J. C. Redmon. Headquarters at 2 Lafayette Square, Washington, D. C. The Bureau is now preparing (1) a glossary of commercial terms that have different meanings in different countries. It will contain all the equivocal names with their local synonyms in parallel columns; in all, about 8,000 words; (2) a compilation of the tariffs of American Republics by articles; (3) a series of Bulletins in three languages, containing sketches of the staples of these countries, some account of the articles of merchandise

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which they import, and others of which they stand in need.

Another recommendation of the Conference which, to the extent of consideration at least, received the approval of Congress, is the establishment of an international American monetary union, and as a basis of this union an international coin or coins of uniform weight and fineness, which may be used in all the countries represented in the Conference. The opinion was declared and adopted that great advantages would accrue to the commerce between the nations of this continent by the use of a coin or coins that would be current at the same value in all the countries represented, and that to give effect to this recommendation a commission composed of one delegate or more from each nation represented should meet in Washington to consider the quantity, the kind of currency, the uses it shall have, and the value and proportion of the international silver coin or coins, and their relations to gold.

Congress authorized the President to invite the governments of the several American republics and the Hawaiian kingdom to send delegates, and also to appoint three to represent the United States in the Commission. The latter have not yet been appointed. This Monetary Union will assemble in Washington on the first Wednesday of January next. The sum of fifteen thousand dollars has been appropriated to pay expenses.

Still another recommendation of the Conference which has been sanctioned by Congress, is the project for a preliminary survey of a route for an inter-continental line of railroad to connect the systems of North America with those of the Southern continent, to be con-

ducted under the direction of a board of commissioners representing the several American republics; the expense to be shared by the several nations of the hemisphere in proportion to their respective populations. The proportion to be borne by the United States is found to be $65,000; which amount Congress appropriated, and at the same time authorized the President to appoint three members of the "Continental Railway Commission" to represent the United States. The commissioners appointed are Alexander J. Cassatt of Pennsylvania, George M. Pullman of Illinois, and Henry G. Davis of West Virginia. Headquarters at Washington. A meeting for organization was called for December 4th.

The fundamental idea of this undertaking is, that in order to develop the growth of material interests, there should be a railroad connecting all the nations of the American continent. That the railroad should connect the principal cities lying in the vicinity of its route, and by branch lines, when cities are not on the direct line.

As is already well known, existing railways will be utilized as far as practicable. Where the results of a survey demonstrate the advisability of a railroad, proposals for construction may be solicited, such construction, as well as the management and operation of the line, to be at the expense of the concessionaires. It has been stated that the complete development of this undertaking is no more formidable than was the construction of the railways to the Pacific across the North American continent.

Mr. George H. Coryell, a well-known civil engineer, says that the talk of a road along the Caribbean sea,

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down through the eastern part of Yucatan, Honduras, Nicaragua, and to Costa Rica is all wrong. The shortest, most economical, and in every way most desirable route is along the foot-hills of the great mountain chain that lies but a short distance back from the Pacific coast. This route would also touch most of the principal cities, and the cost of construction would be much less than would be spent in the other plan. Along the eastern coast the country for nearly the whole distance, for miles back from the sea, is swampy and pestilential. From Mexico to Tehuantepec, according to Mr. Coryell, where the line runs through the Sierra Madre mountains, is the only portion of the route where any heavy work will be required. The Mexican Government is already at work on a line from Mexico to Oaxaca, two-thirds of the distance from Mexico to Tehuantepec, and this will leave about 125 miles of road to be constructed from Oaxaca to Tehuantepec. The rest of the distance down from the isthmus into South America, where it is designed to connect with South American republics' system is comparatively plain sailing. The distance is about 1,400 miles, and the estimated cost of building the road is $10,000,000.

The most important political question unfolded by the Conference would seem to be that of reciprocity. The discussion of this question in and out of Congress, following the memorable letter of the Secretary of State, is so recent and familiar that it need only be referred to here as the key to certain legislation which was engrafted on the recently enacted tariff. *Section 3* provides: "That with a view to secure reciprocal trade with countries producing the following articles, and for

this purpose, on and after January 1, 1892, whenever, and so often as the President shall be satisfied that the government of any country producing and exporting sugar, molasses, coffee, tea, and hides, raw and uncured, or any of such articles, imposes duties or other exactions upon the agricultural or other products of the United States, which in view of the free introduction of such sugar, molasses, coffee, tea, and hides into the United States he may deem to be reciprocally unequal and unreasonable, he shall have the power, and it shall be his duty to suspend, by proclamation to that effect, the provisions of this act relating to the free introduction of sugar, molasses, coffee, tea, and hides, the production of such country, for such time as he shall deem just, and in such case and during such suspension duties shall be levied, collected and paid upon sugar, molasses, coffee, tea, and hides, the product of or exported from such designated country as follows" (a list of duties to be imposed).

It is stated in the letter of the Secretary of State (Sen. Ex. Doc. No. 158, 51st Cong., 1st. sess.) that fifteen of the seventeen republics with which we have been in conference have indicated their desire to enter upon reciprocal commercial relations with the United States; the remaining two expressing equal willingness, could they be assured that their advances would be favorably considered.

A NEW MARINE BOARD.—The late International Marine Conference discussed the following resolution:

Resolved: That the Conference recommends that the advisability of a Bureau of Maritime Information should be considered by the governments of the maritime nations.

The understanding was, that the proposed bureau should consider and recommend for experiment all apparatus and appliances for marine use; such as life-saving appliances, systems of running lights, sound signals, etc.

After a discussion lasting somewhat over a day and a half, it was decided not to recommend the establishment of such a bureau; and the reason for the non-support of the measure was the fact that most of the Great Powers have already bureaus of this nature.

But the delegation of the United States voting in the affirmative on this resolution, thereupon in order to provide for the discharge of such functions in this country recommended, "that immediate steps be taken for the establishment, with headquarters at Washington, of a Board to have charge and general superintendence of matters relating to merchant vessels and seamen; said Board to be under the Treasury Department, and to be composed of the Supervising Inspector of steam-vessels, the Commissioner of Navigation, the Surgeon-General of the Marine Hospital Service, the Superintendent of the Life-Saving Service, two Navy officers, five experts, and an Admiralty lawyer*; the idea being to combine into one board the several bureaus now charged with the execution of duties relating to marine affairs; thereby securing unity of action and efficient results without loss of energy resulting from separate effort by different bureaus on the same matters.

The reasons which constrained the American delegates to make this recommendation are so unfamiliar, if not indeed startling, that they abundantly substantiate

*Proceedings Internat. Marine Conference, Vol. 3, p. 495.

their conclusions as well as the subsequent action of the Treasury Department. They said: "While the laws regarding the Government inspection of *steam-vessels* may be assumed to insure upon them the necessary security of life and property at sea so far as strength of the vessels, proper equipment, etc., are concerned, no such provisions exist by law with regard to sailing vessels. A totally unseaworthy sailing vessel may put to sea at the risk of all lives and property on board: furthermore, she may be overladen and utterly deficient in necessary equipment for the safety of her crew and passengers in case of accident, such as boats, life-rafts, life-preservers, pumps, etc., or fire extinguishing apparatus. This condition of things exists, notwithstanding the fact that the number of sailing vessels belonging to the United States is nearly three times as great as the number of steamers, and the tonnage of sailing craft exceeds that of steamers by more than 300,000 tons. The number of casualties occurring to sailing vessels during 1888, was twice as great as those occurring to steamers, and the lives lost on board sailing vessels were three times as many as those lost on board steamers, although the majority of passengers are carried on board steamers.*

The recommendation of the American delegates was brought more directly to the attention of the Executive Departments by the action of Congress in passing at the last session a concurrent resolution directing "the Secretary of State, the Secretary of the Treasury, the Secretary of War, and the Secretary of the Navy to examine the report and resolutions of the dele

* Proceedings Internat. Marine Conference, vol. 2, p. 496.

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gates of the United States in the late International Marine Conference, and to prepare and submit to Congress bills for the enactment into law of said resolutions."

Thereupon the acting Secretary of the Treasury (Mr. Spalding) in behalf of that department constituted and appointed a committee of Treasury officials to consider the recommendations. The committee organized, and invited in conference, representatives of different marine interests.

Mr. Goodrich, representing the Maritime Association, spoke in favor of organizing a board of trade or commerce, such as has been established by Great Britain. His reason for this was that all the bureaus of this Government relating to the merchant marine were scattered through the various departments and worked separately. He favored bringing them together under one head. President Miller, representing the National Board of Steamboat Navigation, favored such a board. Mr. Mink, chairman of the same association, suggested that the water interests of the United States be harmonized in a committee, not permanent, but subject to the call of the Treasury Committee, to be composed of the several heads of marine bureaus of the Government and six experts in marine affairs. Mr. Mosley of the Atlantic Marine Insurance Company of New York, and Mr. Lyle of the Ohio and Mississippi River Navigation Company, concurred in these views. Mr. Edmunds, representing the Vessel Owners and Captains' Association, opposed the establishment of the proposed board unless the majority of its members were sailing men. Mr. Lawrence of the same association favored the

establishment of the board proposed. Mr. Cook, of the Vessel Owners and Captains' Association, wanted the board to be composed entirely of officers of the Government. Dr. Hamilton, of the Marine Hospital Service, suggested that the board be composed of Government officers alone and that they call upon outsiders for information (as was being done at present) whenever they wished, and that those called be allowed per diem and travelling expenses. This suggestion met with general approval. Mr. Goodrich proposed that a committee draft a bill to be submitted to the different marine associations for their opinion.

The committee subsequently submitted a report to the Secretary of the Treasury, with a draft of a bill to be submitted to Congress. The committee did not agree with the recommendations of the Marine Conference delegates that five members of the Board should be experts in matters relating to the merchant marine, and that an admiralty lawyer, etc., should be *ex-officio* member. The bill provides that there shall be in the Department of the Treasury a Marine Board, which shall consist of one of the Assistant Secretaries of the Treasury, to be designated by the Secretary of the Treasury, who shall be *ex-officio* chairman of the Board, and the following officers, who shall be *ex-officio* members : The chairman of the Light-House Board, the Supervising Inspector-General of Steam-vessels, the Surgeon-General of the Marine Hospital Service, the General Superintendent of the Life-Saving Service, the Commissioner of Navigation, the Superintendent of the Coast and Geodetic Survey, the Chief Hydrographer of the Navy. These offices are now held respectively by Rear-Admiral

David B. Harmony, James A. Dumont, Dr. John B. Hamilton, Sumner I. Kimball, William Bates, Thomas C. Mendenhall, and Lieut. Richardson Clover, Acting Hydrographer.

None of the members of the board shall receive any additional compensation by reason of any services performed under the act, but shall receive mileage at the rate of eight cents per mile when travelling under official orders. The board is to meet for organization within sixty days from the passage of the act, and thereafter quarterly, and at such other times as the Secretary shall direct for joint consultation and recommendation to the Secretary of the Treasury, for presentation by him to Congress of any changes in existing laws, or enactment of new ones, as in their judgment may seem necessary for the protection of the interests of the Government, and the benefit and improvement of the merchant marine, or for the relief of the merchant marine from any illegal, harsh, or unreasonable laws operating to its detriment, and for the transaction of any other business that may properly come before it. The board may, for its information and use, take the examination, or receive the statements in writing of persons of practical knowledge and experience in the building, repairing and navigation of vessels, and in the business management of the merchant marine of the United States, and of the authorized representatives of all organized bodies connected therewith; it shall have supervision of all laws affecting the merchant marine not assigned by law to any other branch or bureau of the Government, and the Secretary of the Treasury shall upon the recommendation of the board, if he approves, assign to either of the

bureaus, or offices under the charge of either of the *ex-officio* members of the board, the execution of any provisions of law relating to the merchant marine not otherwise assigned. The board shall collect all information and intelligence available affecting maritime interests, and from time to time shall publish for the benefit of the Government and of the merchant marine so much of the same as shall be deemed useful ; and all officers of the Government having in their possession at any time such information are directed to furnish the same to the Marine Board when not incompatible with the public interests.

United States Board on Geographic Names.—The circumstances which gave rise to this Board and the details of its organization were quite minutely stated in my Letters of July and October last. Professor Mendenhall, the Chairman of the Board, in a prefatory note to the first Bulletin gives some additional data, which are sufficiently interesting to recite here in order to explain more fully the careful and critical examination of the questions with which the Board has to deal. He says: "In disposing of any question which is brought to the attention of the Board the following plan is pursued: It is first referred to the Executive Committee, consisting at present of Mr. Henry Gannett of the U. S. Geological Survey, Lieut. Richardson Clover, U. S. Navy, and Mr. Herbert G. Ogden, U. S. Coast and Geodetic Survey. This committee is charged with the thorough investigation of the question, and is expected to consult all known authorities and to make use of such assistance as it may find anywhere available. A *résumé* of the results of such investigations, together with a recom-

mendation, is made to the Board at a regular meeting, and after discussion the decision is reached by a vote." He says further: "The Board is already greatly indebted to several correspondents for aid in reaching the decisions published in this Bulletin, notably in the case of the long list of Alaska names, concerning which most of the best authorities on Alaska in this country have been consulted. It desires to continue to receive the assistance of all geographers, historians, and other scholars interested in geographic nomenclature, and will be pleased to receive communications from such at any time. While it cannot hope to be infallible in its decisions, it trusts that with such assistance its mistakes may be few, and that it may succeed in bringing to orderly uniformity the great confusion in nomenclature which now exists in government publications. Although its functions are purely those of a Government Board, and its decisions binding on Government officers only, it may not be improper to express a hope that they may also be followed by the public in general, especially the map and text-book publishers, and to this end copies of the bulletins, which will be issued from time to time as occasion demands, will be sent, as far as possible, to all requesting them."

Lieut. Richardson Clover, Hydrographic Office, Navy Department, is the Secretary of the Board, to whom all communications may be addressed.

The following principles have been adopted by the Board for guidance in determining the official form or rendering of geographical names.

1. That spelling and pronunciation which is sanctioned by local usage should in general be adopted.

2. Where names have been changed or corrupted, and such changes or corruptions have become established by local usage, it is not in general advisable to attempt to restore the original form.

3. In cases where what was evidently originally the same word appears with various spellings sanctioned by local usage; when applied to different features, these various spellings should be regarded as in effect different names, and that, as a rule, it is inadvisable to attempt to produce uniformity.

4. When a choice is offered between two names or more for the same place or locality, all sanctioned by local usage, that which is most appropriate and euphonious should be adopted.

5. The possessive form should be avoided, whenever it can be done without destroying the euphony of the name or changing its descriptive application.

6. Geographic names in countries that use the Roman character should be rendered in the form adopted by the country having jurisdiction, except when there are English equivalents already fixed by usage. In cases where the English equivalent is so different from the national form, that the identity of the latter with the former might not be recognized, both forms may be given.

7. The spelling of geographic names that require transliteration into Roman characters should represent the principal sounds of the word as pronounced in the native tongue, in accordance with the sounds of the letters in the following system. An approximation only to the true sound is aimed at in this system. The vowels are to be pronounced as in Italian and on the con-

tinent of Europe generally, and consonants as in English (Table of Letters, Sounds, and Examples omitted).

Appended is a list of some of the decisions of the Board extracted, from Bulletin No. 1, dated December, 1890.

Note:—Names adopted in HEAVY FACE lower case type, the discarded form in *italics*.

Akun, Alaska. *Akhun, Akoun, Akan.*

Alaska Peninsula. *Aliaska, Aliashka.*

Amchitka Island, Alaska. *Amitkhitka, Amtchitka.*

Amukta Island, Alaska. *Amoughta, Amoukhta, Amuchta.*

Anacostia River, District of Columbia. *Eastern Branch.*

Andreafski Fort, on Yukon River, Alaska. *Andreiefski, Andreivsky, Andreaivsky.*

Andreanaf Islands, Aleutian Islands, Alaska. *Andreanov, Andreanowsky.*

Aniak-chak Bay, East side Alaska Peninsula. *Aniakcha.*

Annobon, Island in Gulf of Guinea, West Africa. *Annabon, Anno Bon, Anno Bom.*

Assini, West Africa. *Assinie, Assinia.*

Attu Island, Alaska. *Attoo, Attou.*

Augustine Island, North of Cape Douglas, East Coast of Alaska Peninsula. *Augustin, Chernaboura.*

Baluchistan, India. *Beloochistan, Belouchistan, Baloachistan, Belutchistan.*

Barbados Island. In West Indies. *Barbadocs.*

Barstow Rock, Coast of Massachusetts. *Barstows Rock, Barslow.*

Becharof Lake, Alaska Peninsula. *Botcharoff, Bochonoff, Rochanoff.*

Bering Sea, Alaska. *Behring, Behrings.*

Big Diomede Island, In Bering Strait. *Ratmanoff, Ratmanof, Noo nar-book.*

Bogoslof Island, West of Unalaska. *Bogoslov.*

Buckland River, into Kotzebue Sound, Alaska. *Kunguk.*

Buen Ayre, Island in Caribbean Sea. *Bonaire.*

Chile, South America. *Chili.*

Chilkat, River and Pass, Alaska. *Chilcat.*

Chilkoot, Village and Pass, Alaska. *Chilkut.*

Chiniak Bay, North-east of Kadiak, Alaska. *Chiniatskov.*

Dall Point, south of Cape Romanzof. *Cape Dall.*

Deadman Point, Maine. *Deadman's Point.*

Fiji Islands, South Pacific. *Feejee, Viti, Fidschi.*

Guadeloupe Island, West Indies. *Gaudeloupe.*

Haiti, Republic in West Indies. *Hayti.*

Helgoland, Island in North Sea. *Heligoland.*

Hudson Bay, Canada. *Hudson's Bay.*

Isla de Pinos, West Indies. *Isle of Pines, Pinos Island.*

Kadiak Island, Alaska. *Kodiak.*

Kongo, River and State, West Africa. *Congo.*

Little Diomede Island, Alaska. *Igna-look, Krusenstern.*

Lynn Canal, Alaska. *Lynn Channel.*

Magdalen Island, Hudson River. *Slippe Stein.*

Oudh, British India. *Oude.*

Point Arena, Coast of Chili. *Punta Arenas.*

Pribilof Island, Alaska. *Pribyloff.*

Puerto Rico, Island in West Indies. *Porto Rico.*

Saint Croix, Island and Town, West Indies. *Santa Cruz.*

Salvador, Central America. *San Salvador.*
Sorrento Harbor, Coast of Maine. *Point Harbor.*
Stikine River, Alaska. *Stikeen.*
Unalaska Island, Alaska.. *Ounalashka, Unalashka, Oonalaska, Ooanalashka.*

The Bulletin contains a list of two hundred and twenty-six corrected names.

Dr. John B. Hamilton's Plan for Regulating Immigration.*—That every person intending to emigrate to the United States shall have a certificate from an American consul setting forth that he has not been convicted of any crime nor been a public charge or received public assistance, and that he is suffering from no contagious or chronic disease or disability. Satisfactory evidence of these conditions must be supplied by every intending emigrant, and filed in the consular office.

Dr. Hamilton recently visited the principa ports of embarkation of emigrants bound for the United States, and as a result of his observations makes suggestions that should not go unheeded.

There is no systematic medical examination of emigrants at any port. Some of the steamship lines require their surgeons to make a preliminary examination which, however, in no case compares with the examinations made at New York by the officers of the Marine Hospital Service, as the purposes are entirely different, that of the steamship company being to pass all that can be passed, while the purposes of the Marine Hospital inspection are to report all cases that are likely to become

*Annual Report of the Supervising Surgeon-General of the Marine Hospital Service for the year ending June 30, 1890.

a public charge. Recently fifteen insane persons and eleven idiots were reported to the Superintendent of Emigration by the medical officer at New York; but, as the law does not allow the Superintendent the right to exclude immigrants, but only to submit such cases to the Collector, they are in some instances taken before the courts on a writ of *habeas corpus*, and, with the usual confusion of "expert testimony," a bright and skillful lawyer is nearly always able to secure the landing of any immigrant, provided he is not absolutely a raving maniac when brought into the court room. In the case of the 27 defective persons above cited, 4 of the insane and all of the idiots were permitted to land!

Dr. Hamilton is of opinion that, as the admission or rejection of an immigrant is a national affair, such suits should by law be required to be conducted in the United States Courts rather than in local courts, more or less subject to local influences. There is no country in the world in which citizenship is so cheaply obtained as in the United States—"the asylum of the oppressed," but he does not think that the founders contemplated that the country should wholly degenerate into an asylum and little else. The general question of restrictive measures is one of the most important that can be considered; and, viewed from an American standpoint there is no doubt that the welfare of the country demands greater restrictions than the present laws seem to be able to furnish, not less in the interest of those now on the soil than in that of the natural born citizen.

It is a fact, says Dr. Hamilton, that most foreign countries do not encourage emigration to the United

States, or, if it is encouraged, it is of a class they can well afford to spare. It is not the successful merchant and the skillful artisan that emigrate. On the contrary, the man who fails, the class of criminals whom the authorities give "so many days to leave the town," the persons without employment, are those who naturally desire to emigrate. To these must be added that large proportion of emigrants who now come to join friends and relatives. It is the settled policy of most foreign governments to encourage the emigration to their own colonies of such intending emigrants as are desirable additions to the population. The vast number of 2,666,276 foreign people introduced into our political organization within the last six years, most of whom are entirely ignorant of our traditions, customs and laws, cannot be viewed without concern and apprehension.

Mr. Lodge of Massachusetts recently (December 1) introduced a bill in Congress "to regulate immigration." Its principal provisions are: That no alien shall be admitted into the United States who is an idiot, insane, a pauper, or liable to become a public charge, or who has been convicted of a felony or other infamous crime or misdemeanor, or who is a polygamist, anarchist, or nihilist, or who is hostile to the form of government or constitution of the United States, or who is afflicted with any loathsome or contagious disease, or who has entered into any contract to perform labor or service for any person, firm or company, or corporation. This section not to apply to professors in universities or ministers of the Gospel. That no alien shall be admitted into the United States without the certificate of

a consul or diplomatic representative, applied for at least three months prior to embarkation, setting forth that the holder is not obnoxious to any law of the United States in regard to immigration, that he is a person of good character and reputation, receives no assistance to enable him to emigrate, that he is self-supporting and capable of supporting a family, if he has any. That, if over twelve years of age, he can both read and write in his native language, and can read the constitution of the United States either in English or in his native language. That he is physically and mentally sound, in good health, and free from disease or deformity, as certified by a physician in good and regular standing known to the consul. It is made the duty of the consul or diplomatic representative to inquire into the character of each applicant and to require proof of all the facts certified ; and any fraudulent issue of such certificate shall be punished by a fine of $1,000 in each case. The applicant shall pay $2.00 for such certificate.

That upon the arrival at any port of entry or other place of any citizens or subjects of any foreign government it shall be the duty of all commanders, officers and agents of the particular vessel, railroad train, or other vehicle of transportation, to report the name, number, nationality, and condition of every such passenger, before any of them are landed, to the Collector of the Port, who shall cause an inspection of all such passengers and examine their certificates. In cases of delay or detention such foreign persons shall be properly housed, fed and cared for. That every person, vessel, railroad, steamship, or transportation company, shall make sworn return of the immigrants

brought by them, and shall pay five dollars to the Collector for each immigrant brought by them to the United States. No vessel shall transport on any one voyage more than the proportion of one passenger to every five registered tons of such vessel. Immigrants not holding consular certificates shall be returned by and at the expense of the vessel which brought them here.

The Circuit and District Courts of the United States are invested with full jurisdiction of all causes, civil and criminal, arising under the provisions of this act; and no State court or court of the United States shall admit to citizenship any person, who by the provisions of this act is not permitted to come to or land in the United States, or who does not hold a consular certificate. The Secretary of the Treasury is charged with the duty of supervising immigration, and of regulating all matters pertaining thereto.

MOUNT ST. ELIAS EXPEDITION.—Mr. I. C. Russell, chief of the Mount St. Elias expedition, and Mr. Mark B. Kerr,* the topographer, have made their reports to the National Geographic Society on explorations carried on last summer. These reports form a very interesting chapter in the year's record of scientific exploration. The work planned for the expedition was to make a topographical map of the region between Yakutat Bay and Mount St. Elias, and to study the glaciers and geology of the region. Mr. Russell, it will be remembered, traversed the Yukon region in 1889, the account

*The substance of these remarks is largely, and for the most part in the exact words of Mr. Russell, as addressed to a public audience in Washington on the evening of November 26, and of Mr. Kerr, as addressed to the National Geographic Society, at a meeting held November 28, to which the public was invited.

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of that expedition being in the A. G. S. BULLETIN for March, 1890.

The party, consisting of nine, left Seattle, June 17, arriving at Sitka on the 24th. On the 26th they reached Port Mulgrave. From this point, on account of shoal water, surf and inclement weather, the journey was made in small boats until a landing was effected on the 30th, on the north shore of Yakutat Bay. The party camped at the base of a rugged mountain range trending south-east and north-west, separated from the sea by a low, densely wooded plateau, some thirty miles broad. One of the most interesting excursions made from the camp, says Mr. Russell, was a canoe trip to an island near the head of Yakutat Bay, which rises more than a thousand feet above the water, and furnishes an unobstructed view of the encircling mountains. At the immediate head of the bay one of the grandest glaciers of Alaska comes down to the water, and ends in a magnificent line of ice cliffs several miles in length and hundreds of feet high. A few miles inland is a towering snow-covered mountain peak from which this glacier derives its snow and ice. The mountain and the glacier were named in honor of the President of the National Geographic Society—Hon. Gardiner G. Hubbard.

On the north shore of Yakutat Bay, Mr. Kerr selected a base line across the moraine, 3,850 feet in length. The base was measured, Mr. Kerr says, very carefully twice by steel tape, stretched in 50-foot tangents from the top of one stake to the top of the next one, and each stake driven a uniform depth into the ground. The difference of elevation between the two ends was 49 feet, and the correction in reducing the line to the horizontal was

0.24 feet. The difference in the two measurements was three inches, and the intersection was perfect on the top of the tent near the bay shore, from stations W. B., Crater, Dome, and Yakutat, thus checking the measurement. The alignment was made by the transit instrument, and the elevations were taken by angulation and by cistern barometer. The instruments used in the work of the survey were transit, gradienter, sextant, cistern barometer, aneroid, and prismatic compass. Mr. Kerr was engaged until July 6th, in measuring the base line, extending triangulation and making a general topographic map. On the 5th of July, he took his first sights of Mounts Saint Elias and Cook, and by rough calculation found the heights to be 13,950 and 11,030 feet respectively.

The journey inland was found to be extremely difficult on account of the dense vegetation that covered all the lower slopes, and the rugged character of the glaciers, which for most of the way were either crevassed or covered by dirt and stones. The way to Mt. Saint Elias led along the borders of one of the largest glaciers in the world, of the Piedmont type,—a living illustration of the character of the continental ice sheet, that formerly covered all of New England and a large portion of Canada. It is hundreds of square miles in extent, and is fed by ice streams from the mountains of such volume that it has actually displaced the ocean. A little island formed of moraine materials, rising through the glacier, was named Blossom Island, on account of the beauty and luxuriance of the flowers that grew everywhere upon it, and this spot was chosen as a base camp from which expeditions were made to the higher

mountains. A pass leading westward was found near the head of a glacier which descends from the western slope of Mount Cook. It has an elevation of about 4,000 feet above the sea, and was called "Pinnacle pass." Descending this western slope another great glacier reaching far inland to the north of Mount Cook was reached, and named "Seward Glacier." Beyond the Seward glacier another opening named "Dome pass" was reached, leading westward. Crossing this pass, and descending, another floating river of ice was met, and the route of the explorers led up this glacier to the northern base of the immediate summit of Mount St. Elias.

The highest point was reached August 22d. All the difficult places and large crevasses had been passed, and about 2,000 feet remained to the summit of the divide. This saddle between St. Elias and a peak next was called Newton. It is about 11,500 feet high, and a clear slope of hard snow reaches without a break to the top of the mountain, about 4,000 feet above the saddle. At an elevation of 9,500 feet it began storming, and before morning four feet of snow had fallen. The party moved to a lower camp, finding their way with great difficulty through the storm of snow and wind. A second effort was made to reach the peak, but another snow storm more severe than the first was encountered. The attempt to reach the summit of Mount St. Elias was abandoned and the expedition returned to Blossom Island, after living thirty-five days above the snow line. Mr. Kerr obtained five determinations for the altitude of the mountain, which place it at 15,350. The expedition returned to Yakutat Bay about the

20th of September, and reached Port Townsend October 2d.

The results of the expedition include the discovery of a thoroughly practicable route by which the summit of the mountain can be reached; accurate measurements of glaciers and their rate of motion; geologic studies of great interest; and a contour and topographic map of a hitherto unknown region more than a thousand square miles in extent. Fossil plants and shell-fish were discovered 4,500 feet above the sea-level. The elevations of all the mountains of the region explored were found to be less than had formerly been supposed. St. Elias is not an ancient volcano as has been reported by sea captains, but is formed of sedimentary rocks. The peak is the end of a roof-like ridge, in which the rocks dip north-east. Mr. Russell says that the appearance of smoke which has been observed is doubtless due to the mist and dust caused by the great avalanches of rocks, which sometimes come down the mountain sides. The geographical position of Mount St. Elias is placed in latitude 60° 12′, longitude 140° 46′. The heights in feet of various peaks are given as follows: Augusta, 13,105; Cook, 12,370; Vancouver, 9,884; St. Elias, 15,350.

TABLE OF DETERMINATIONS OF MOUNT ST. ELIAS.

Date.	Authority.	Height in feet.
1786	La Pérouse	12,672
1791	Malaspina	17,851
1847	Russian Hydro. Chart	17,854
1847	Tebenkoff	16,938
1849	Buch, *Canarische Inseln*	16,758
1872	English Admiralty Chart	14,976
1874	U. S. Coast Survey	19,500
1890	Nat. Geographic Society	15,350

If this expedition had arrived at its highest point ten days earlier, the summit of Mount St. Elias would undoubtedly have been reached.

The Secretary of War in his annual report calls attention to the advisability of further and more complete explorations of the interior of Alaska. He says:

"Three or four reconnoissances have been made by officers of the army through portions of the territory, and the courses of several of its great navigable rivers have thus been determined. These expeditions, however, were inadequately prepared for the work of exploration, the journeys were necessarily made in very great haste and were confined to the rivers. No systematic exploration of the interior has ever been attempted by the government, and the topography, resources and capabilities of Alaska are practically unknown. In order to obtain exact and trustworthy information concerning this territory I have approved a proposition to organize a thoroughly equipped expedition to make a systematic exploration and survey of Alaska. The duty will be undertaken by competent officers and men with, in my opinion, a fair prospect of important results. I recommend that a sufficient appropriation be made by Congress for carrying the plan into effect."

The Superintendent of the Coast and Geodetic Survey has had telegraphic communication, by way of San Francisco, from the two parties on the upper Yukon and Porcupine rivers, engaged in surveying the boundary line between Alaska and the British possessions. Mr. Turner, the chief of the Porcupine River party, completed his work on the 141st meridian last spring, and reached St. Michaels, where he will winter, August

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20th. Mr. McGrath will spend the winter on the upper Yukon completing his astronomical observations. This is the first news from Turner since January last. Detailed reports have not yet come to hand.

Mr. Ivan Petroff has already travelled over 12,000 miles in Alaska on the work of collecting statistics for the Eleventh census. The schedules used cover the following subjects: White or civilized population; Native population; Churches, schools, canneries and fishing; Trade and commerce; Gold and silver mining; Coal mining. The enumeration is nearly completed, but the returns have been received only in parts; those from several interior districts cannot be obtained until next spring. H.

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